Ministry of Finance WORKING PAPER No. 16

www.pm.gov.hu

DÓRA BENEDEK, MARIANN RIGÓ, ÁGOTA SCHARLE AND PÉTER SZABÓ

INCREASES IN THE MINIMUM WAGE IN HUNGARY, 2001–06

January 2006

Authors: Dóra Benedek
Mariann Rigó
Ágota Scharle
Péter Szabó

Ministry of Finance

Series Editors: Dóra Benedek and Ágota Scharle

Ministry of Finance

Economic Research Division

The Economic Research Division (former Strategic Analysis Division) aims to support evidence-based policy-making in priority areas of financial policy. Its three main roles are to undertake long-term research projects, to make existing empirical evidence available to policy makers and to promote the application of advanced research methods in policy making.

The Working Papers series serves to disseminate the results of research carried out or commissioned by the Ministry of Finance.

Working Papers in the series can be downloaded from the web site of the Ministry of Finance: http://www.pm.gov.hu

Series editors may be contacted at pmfuzet@pm.gov.hu

Summary

Following wage rises in 2001 and 2002, the statutory minimum wage increased in real terms by about 70%, and in 2006 it grew by 5.5%. Differentiation by qualifications – as proposed by the government – will take effect from July 2006.

There is a statutory minimum wage in 19 out of the 25 EU member states, while six member states have no such regulation. Where the amount of the minimum wage is differentiated, it is usually on account of lower levels of productivity (e.g. in the case of people only starting out on their careers) that a lower-than-average minimum wage is set.

The impact of a rise in the minimum wage cannot be predicted precisely on the basis of economic theories. International experience also varies, although significant increases have led to a decline in employment in almost all cases. After the increases in the minimum wage introduced in Hungary in 2001 and 2002, employment did not decline across the national economy as a whole, but the number of people employed in certain sectors did drop substantially. This affected primarily smaller enterprises, unskilled and older employees, and regions with high rates of unemployment. The minimum wage increase did not reduce the budget deficit because businesses could balance the increase in their costs by slightly increasing tax avoidance.

A higher minimum wage can reduce poverty by increasing the income of people on the minimum wage in poor households by more than the average rate. The majority of people on the minimum wage, however, live in medium or higher-income households. Most poor people are not affected by any increase in the minimum wage since they are unemployed.

The increase in the minimum wage in 2006 could affect some 700,000 to 900,000 people. The economic environment is better today than it was in 2001 and 2002, but this increase is based on a larger amount, so it could lead to a perceptible decline in employment, with reduced chances of employment primarily for unskilled and older people with lower productivity.

1. Introduction

As in many other countries, proposals to increase the minimum wage are made quite often in Hungary. When it comes to the anticipated consequences, however, views are divided. Many consider such a measure to be an effective tool in reducing poverty; others regard it as a move that will result in deteriorating employment rates. It goes without saying that the impact of an increase in the minimum wage is a complex one and the form it takes depends on a large number of factors. In this paper the authors provide a theoretical and empirical overview of such factors in order to facilitate a reliable forecast of the impact of the increase in the minimum wage that is planned for 2006.

The impact of introducing and increasing a minimum wage can be assessed and interpreted in a variety of theoretical economic frameworks. According to neo-classical models, increasing the minimum wage reduces employment, because employees whose performance falls short of the new minimum wage level will be made redundant. Those who prefer other models, however, might argue that there is no perfect competition on the labour market, and if enterprises can influence wages then a rise in the minimum wage need not have a negative impact, and indeed may even result in increased employment rates. However, even these models reveal a level of the minimum wage above which any increase will have a negative impact.

The findings of empirical research projects carried out in Hungary show that a large increase in the minimum wage does tend to have more of a negative impact. Hungary has already seen a very substantial increase: in 2001–02 the government then in office practically doubled the minimum wage. The impact of that measure has been assessed in numerous studies, and the findings show that, on the whole, employment was adversely affected, the employment opportunities for people in less advantageous positions deteriorated, and the effects on the budget also proved negative.

This study sums up the factors that determine effects on employment and other aspects, along with the domestic and international experience relating to the issue in hand. First of all, we provide a review of the recommendations of international organizations and the practices of EU member states. The second section summarizes the available technical literature relating to the minimum wage. This is followed by a description of international and domestic empirical research programmes that focus on the impact on employment, the budget and redistribution. Finally, drawing on the theoretical and empirical conclusions, the authors will attempt to predict the possible effects of the government's proposal.

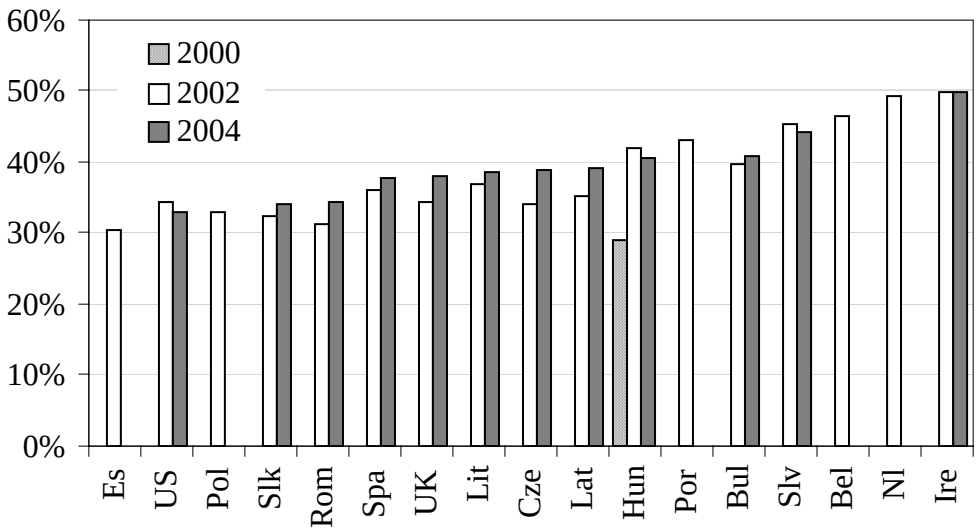
2. International practice and recommendations

There is a wide variety of minimum wage systems. In some countries the minimum wage level is prescribed by law; in others it is determined by formal or informal consultations between employers and employees. The level of the minimum wage may, in some countries, vary according to the age of the employee, occupation and/or family status, or the region of employment, etc.

2.1. International practice

As a percentage of the average wage,[1] the rate of the minimum wage currently in operation in Hungary is not low by international standards (*Figure 1*). The 40.7% rate is higher than in the USA or the UK, and also higher than the rates in effect in the Czech Republic, Poland and Slovakia, which are important to us as a basis for comparison.

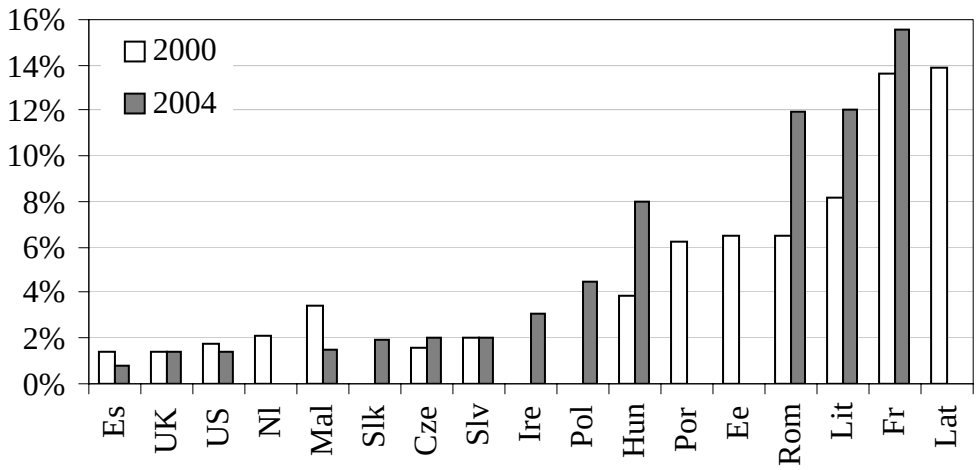
Figure 1: Minimum monthly wage as a proportion of average monthly earnings in industry and services (%)



Source: Eurostat online database, downloaded on 18 October 2005.
http://epp.eurostat.cec.eu.int/portal/page?_pageid=1073,46870091&_dad=portal&_schema=PORTAL&p_product_code=av_mmw

[1] Average wage of employees in industry and services.

Figure 2: Proportion of full-time wage earners on the minimum wage (%)



Source: Eurostat online database, downloaded on 18 October 2005.

http://epp.eurostat.cec.eu.int/portal/page?_pageid=1073,46870091&_dad=portal&_schema=PORTAL&p_product_code=pc_mmw

A review of the proportion of full-time employees on the minimum wage reveals a similar picture (*Figure 2*). This indicator shows the effectiveness of the minimum wage – that is, its proximity to the average wage level that would exist without regulation. Aside from the minimum wage, however, it is also affected by levels of schooling and by the age profile of employees, and therefore it may be relatively high in less well developed economies, even if there is no effective minimum wage. As a Eurostat publication notes (Regnard, 2005), in EU member states a higher minimum wage results in higher proportions of people on the minimum wage (exceptions to this being France and Luxembourg).

A statutory national minimum wage has been introduced in 19 of the 25 EU member states. In most of these countries the level has been set with some form of differentiation.

Table 1: The practices in setting and differentiating minimum wages in the EU member states, 2005

	Basis of differentiation	**Minimum wage***	**Country**
No minimum wage			Austria, Germany, Denmark, Finland, Italy, Sweden
No differentiation	**–**		Hungary, Estonia, Lithuania, Portugal, Slovenia
Based on average productivity			
Based on age and	under 16 years of age	30–50%	Netherlands, Slovakia

service period			
	under 17–18 years of age	70–95%	France, Ireland, Luxembourg, Malta, Slovakia
	under 22–23 years of age	45–85%	Belgium, United Kingdom, Netherlands
	during the first 6–24 months of employment	80–95 %	Czech Republic, Poland, Cyprus
Altered working capability	total disability pension partial disability pension	75% 50%	Czech Republic, Slovakia
Casual workers and outworkers	casual workers and outworkers		Spain
Qualifications, sector, trade	people with qualifications, for 16 areas (wage councils)	120% 100+–	Luxembourg, Malta
Position	Mandatory wage tariff of 12 elements		Czech Republic
Based on fairness			
Service period and family status	0–15 years of service; with spouse	100–123% +13%	Greece
Hazardous job		115 %	Latvia

Source: European minimum wage survey, *European Industrial Relations Review*, August 2005.
Note: *As a proportion of the general minimum.

2.2. Recommendations of international organizations

EU and ILO recommendations concerning the minimum wage

One document of relevance to a possible optimum level of the minimum wage is the European Social Charter of the Council of Europe. The charter declares that everybody has the right to a wage 'sufficient for a decent standard of living', without offering a more specific definition. The independent expert body supporting implementation of the Charter has formulated a more specific recommendation, according to which the optimum level of the net minimum wage is 60% of the national net average wage,[2] and is definitely higher than the

[2] The most frequently applied method in comparing minimum wage systems studies the ratio of minimum wage to average wage. This ratio is known as the 'Kaitz index'.

poverty line. If it is below 60% but can be shown to be above the poverty line, 50% may be acceptable as a minimum.

The International Labour Organisation (ILO) sets out two general expectations concerning the minimum wage. On the one hand, it should be in line with wages, the cost of living, social transfers and the general standards of living; on the other hand it should be in line with economic growth, productivity and the need for a high rate of employment.

Employment policy guidelines of the European Union, 2005–08

The EU recommendations affecting all member states do not tackle increases in the minimum wage, but most of the guidelines formulate goals whose attainment is complicated by increased minimum wage levels:

a) The rate of employment should be raised (target: 70%)

b) Employment-friendly labour cost increases should be ensured by creating effective wage-bargaining systems, by reviewing and reducing social contribution burdens – especially among low-paid workers

c) Young people should be assisted in joining the labour market, and the economic activity of older people should be stimulated

d) Employment should be made more attractive by reducing disincentive elements of tax and welfare systems, by improving job-seeking services, and by boosting those social services that facilitate labour market integration

e) The flexibility of the labour market and job security should be strengthened jointly. This involves clamping down on employment in the 'black' economy and facilitating the launch of businesses

Country-specific Council recommendations 2004

The recommendations specifically targeted at Hungary call for greater adaptability on the part of employees and entrepreneurs, for employment to be made more attractive, and for investment in human capital to be promoted in order to raise the low level of employment, and especially to boost the employment of older people. There is no reference to a minimum wage among the measures aimed at making employment more attractive. The recommendation suggests that a reform of the welfare system and of services in the health insurance system should be introduced to make employment worthwhile and to cut down on the level of 'black' employment.

In summary, neither the international recommendations nor the ratios of the minimum wage to the average wage observed in other countries appear to justify any increase in the existing level of the minimum wage in Hungary.

3. Theoretical background

In models that assume perfect competition and symmetrically informed economic actors,[3] any increase in the minimum wage always has a negative impact on employment. A rise in the minimum wage broadens the range in which it is no longer worth employing a worker because the receipts from the product or service generated by the employee fall short of the wage that must be paid to the employee. This reduces the flexibility of the labour market, as it prevents wages being cut when such a move is necessitated by deteriorating market conditions; under such circumstances, businesses can only respond to change by cutting their headcount. Other models may show positive impacts on employment, such as in the case of the so-called local monopsony model, where the enterprise concerned is the only buyer on the market.

A rise in the minimum wage may result in a general wage increase, even if the minimum wage is fixed below the equilibrium level of the average wage. This has a direct impact on those employees on the lowest wages, while other workers will feel the indirect effect if enterprises try to maintain wage differentials as a means of motivation or for some other reason.

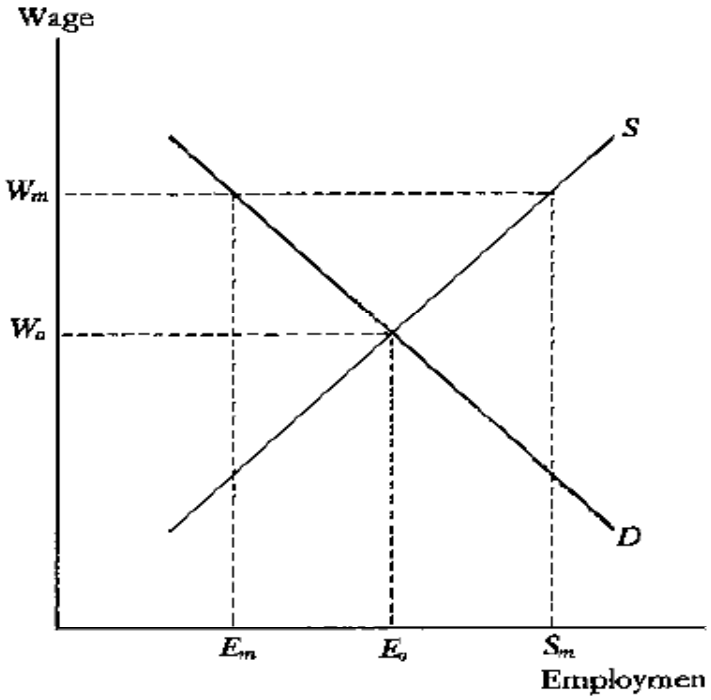
3.1. Effect of the minimum wage in classical economics

In the classical model of the labour market, the assumption of perfect competition means no enterprise can affect wages, and thus both the equilibrium wage and the level of employment are determined by the intersection of the curves of labour demand (D) and labour supply (S) (*Figure 3*). As wages (W) increase and as supply grows, so earnings decline. Labour is homogeneous, i.e. employees are identical in all relevant respects – including qualifications and skills – and therefore all of them earn the same wage.

According to this model, the equilibrium employment level is E_0, before the introduction of a minimum wage, at a wage level of W_0 (*Figure 3*). If a minimum wage is introduced that is higher than the equilibrium wage (W_m), demand for labour will drop to E_m and at the same time the number of people who would be willing to work for the higher wage will increase to S_m. At a given level of the minimum wage, the more flexible the demand for labour is (the flatter the D curve), the more substantial the decline in employment will be. On this point, Brown *et al*. (1982) noted that, instead of reflecting the whole of the oversupply (S_m–E_m), the unemployment statistics will only show the number of people actively looking for jobs at the increased wage level.

[3] Under the conditions of perfect competition, no employer can materially influence the wage level: wages are determined by supply and demand. In the case of symmetrical information, the employer knows just as much about the capabilities and the actual performance of the employee as does the employee himself.

Figure 3: Labour supply and demand in the classical model



Source: Brown *et al.* (1982).

3.2. The effect of the minimum wage in the monopsony model

Models that jettison one of the fundamental assumptions of the classical theory – perfect competition on the labour market – may offer findings that are even diametrically opposed to the conclusions of the classical model. One example of this occurs when there is a monopsony on the labour market, i.e. where there is just one or a few enterprises on the demand side of the market, as a dominant factor. The monopsony model can be used even on the basis of more realistic assumptions; for instance, in all cases where changing jobs is too costly, or where there is only one employer within reasonable reach for employees, and so where employers have a stronger bargaining position than employees (Manning, 2003).

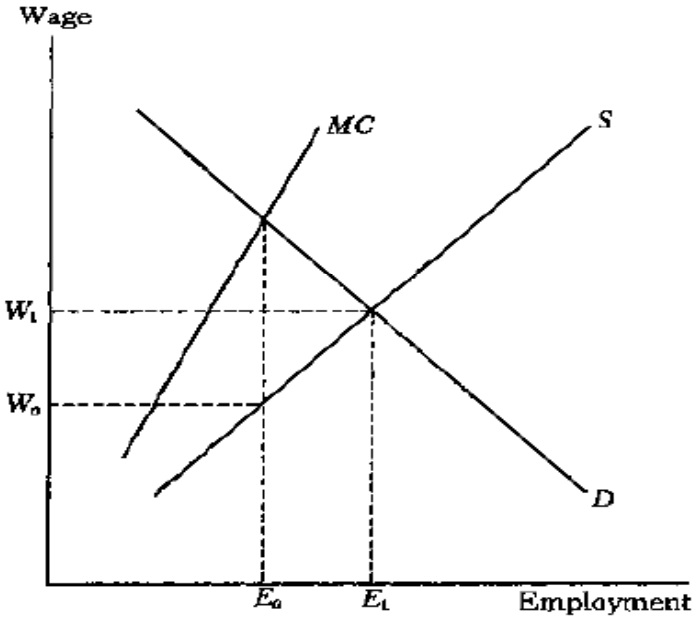
In the case of a monopsonistic labour market, if there is no statutory minimum wage, the level of employment (E_0) is determined by the intersection of the curve of the marginal cost of labour (*MC*) and that of demand (*D*) (*Figure 4*).[4] By virtue of its dominant position, the enterprise can pay the lowest possible wage for which it still finds sufficient labour, instead of a wage that corresponds to the marginal revenue generated by an employee's work. The equilibrium wage is determined by the supply of labour instead of by the marginal cost: in the figure this will be the wage level W_0 on the labour supply

[4] The marginal cost of labour is the cost of hiring one more employee. Demand for labour can be derived from the marginal revenue – this is the income of the enterprise from the output of one additional employee. For the enterprise, it is worth hiring employees so long as the marginal revenue is larger than the marginal cost.

curve (S) at point E_0. Clearly, in this case both the employment level and the wage level are lower than in the case of perfect competition.

If, under such circumstances, the government introduces a statutory minimum wage, it forces the employer in a stronger bargaining position to accept the increased wage level, and can thus achieve an increase in employment along the supply curve. The new wage (W_m) will entail an employment level $S(W_m)$. If the minimum wage is fixed at the wage level prevailing in a competitive market (W_1), the level of employment will also correspond to that prevailing in the competitive market (E_1). Accordingly, the level of employment can be increased up to this point by setting a minimum wage that is higher than the original wage level. However, a minimum wage set higher than level W_1, will result in a level of employment below that prevailing in a competitive market, and a very high minimum wage level may even reduce employment to below the original level of employment.

Figure 4: The effect of a minimum wage increase in the monopsony model



Source: Brown *et al*. (1982).

A further problem is that, in contrast to another assumption of the classical model, labour is not homogeneous: people differ in age, by region, etc., and consequently there is not one labour supply curve but many. Consequently, if the state sets the minimum wage on the basis of some national average, in some markets – where it is higher than the competitive market level – it may trigger a significant drop in employment, while in other sectors it may not achieve the maximum possible increase in employment.

As we have seen, theories alone do not give us the required guidance concerning the effects of a minimum wage on employment; therefore we must resort to findings of empirical research. Quite a number of authors have been

dealing with this area, and perhaps the most widely known analysis is that produced by David Card and Alan Krueger (1994), along with other related studies. This will be discussed in more detail in the section summarizing empirical research programmes, but it should be noted here that not even the international findings of empirical research can close the theoretical debates definitively, because examples can be found of negative, neutral and positive impacts on employment. That is why we need empirical research using data on the Hungarian economy.

3.3. Additional alternative approaches to the impacts of the minimum wage

According to efficiency wage models, wage is not only a function of productivity: it is also used to stimulate increased effort and to build loyalty among employees. For this reason, employers may offer wages higher than the equilibrium to maximize productivity and consequently minimize labour costs. One reason for higher efficiency wages may be that the enterprise is growing, which makes it more difficult to control employees. According to efficiency wage theories, where productivity is determined by wages an increase in the minimum wage may also result in increased employment.[5]

Another approach argues that enterprises finance training at the workplace from the amount saved by paying less than would be justified by the productivity of the worker, and therefore an increase in the minimum wage has a negative impact on training. Acemoglu and Pischke (1999) apply a monopsony model to estimate impacts on training. They assume that there is a certain experience built up at the workplace that results in growing productivity, which generates rent for the company. According to their model, some employees can be trained only if the employer contributes to the costs, while others can afford to pay for their own training. If the minimum wage is higher than the productivity of the trained employee, it is worth training the employee.[6] An increase in the minimum wage reduces the rent retained by the employer; however, it can be partly or fully recovered through training, by increasing the employee's productivity. Of course, the minimum wage must not be so high as to prevent any kind of employment at all. On the other hand, in the case of employees who could finance the costs of their own training by accepting pay below the minimum wage, an increase in the minimum wage has a negative impact and reduces their training. The complex impact can be established only through empirical research.

Acemoglu and Pischke (1999) used a database from the US containing information on the employment and training of young people (National

---

[5] For a more detailed discussion of the efficiency wage theories, see Kertesi and Köllő (2003).

[6] If a skilled and an unskilled employee both have to be paid the minimum wage (because the productivity of the skilled employee is also below the minimum wage level, though it is higher than that of the untrained one), it is more worthwhile for the company to employ the skilled worker.

Longitudinal Survey of Youth, NLSY) to study the likelihood of diminishing training at the workplace among individuals affected by an increase in the minimum wage. The NLSY database contained data on young people aged between 14 and 21 years in 1979. The authors used the 1987–92 period within this panel to work out their estimates. They found that the probability of training was no lower among those working for the minimum wage than among other employees. The authors note that this model does not necessarily contradict the classical theory, so long as the training provided by the company is quite specific, and focuses on the skills required for the given job instead of developing general skills. This, however, is not supported by statistics, according to which 63% of training programmes in the USA are of a general nature, or are predominantly general (14%). In assessing the above findings it should also be taken into account that the authors could study only the formal training programmes, while informal training is much more extensive in low-paid jobs.

An increase in the minimum wage may also affect the size of the formal and the informal (grey or black) sectors. According to traditional arguments, an increase in the minimum wage might drive certain activities into the grey or black sector for two reasons: employees are paid lower wages and the greater risks occasioned by an increase in the minimum wage can be mitigated by moving into the grey or black sectors. The reason for this is as follows: if one of the features of the informal sector is self-employment and performance-based pay then, though the wages may be the same or even higher than in the formal sector, the employee is paid on the basis of his performance, and so the employer faces a smaller risk of not receiving adequate performance for the wages paid. Consequently, from the point of view of the employer, there is a lower risk of inadequate performance on the part of the employee than exists in the formal sector. Nevertheless, if the higher minimum wage facilitates migration from rural to urban areas, the increase in the supply of poorly qualified labour might also trigger an expansion of the informal sector.

4. The findings of empirical research in international literature

Empirical research has generated ample literature on our subject, and different studies have produced at times contradictory findings. However, two relatively stable conclusions do seem to crystallize from this highly versatile empirical literature. One is that negative impacts on employment affect primarily the young generation (Brown *et al.*, 1982; Dolado *et al.*, 1996). The other important conclusion is that the effects of the minimum wage are significantly influenced by the economic environment, for example by the ratio of the minimum wage to the average wage, the number of employees concerned, and whether there is a period of economic upturn or a slump. The findings of different empirical research projects vary widely in terms of the direction in which the minimum wage impacts on employment, and the

emphasis of research has increasingly shifted to the question of whether the minimum wage has any material impact on employment at all.

This subsection discusses the results of empirical research projects and highlights differences between the applied methodologies.

4.1. A minimum wage increase may have a positive or a neutral impact

The 1990s saw a large number of empirical studies, which found weak – neutral or even positive – correlations between a minimum wage and employment. A study published by Katz and Krueger (1992) was perhaps the first of these. It explored the impact of an increase in the minimum wage on the fast-food market of the state of Texas using a multivariate (ordinary least squares OLS) method. The authors refuted the hypothesis of a negative effect on employment. The difference-in-differences (DiD)[7] method (which has come to be much more widely used in programme evaluation) was applied by Card and Krueger (1994) in their empirical analysis, which has attracted a lot of attention since its publication. The authors studied the impact of an increase in the minimum wage on employment and wage levels in fast-food restaurants in New Jersey and Pennsylvania; contrary to the classical hypothesis, they too found a positive impact on employment. The minimum wage was increased in New Jersey in April 1992 from US$ 4.25 to US$ 5.05, while it remained unchanged in the neighbouring Pennsylvania. By comparing the two states, the authors found no definite negative relationship between the rise in the minimum wage and employment. At the time this finding was something of a breakthrough.

For their study Card and Krueger (1994) chose fast-food restaurants – which were expected to be severely affected – because they had large numbers of low-paid workers and because this sector had been found to be highly responsive to questionnaire surveys. The authors sent their questionnaires to 410 fast-food restaurants before and after the rise in the minimum wage. In both periods the response rate was higher than 90%. The control groups comprised fast-food restaurants that also operated in New Jersey but that paid higher wages to their employees, who consequently were not affected by the increase (control group A), and fast-food restaurants operating in Pennsylvania (control group B).

Their estimates, based on the difference-in-differences (DiD) method, showed that in New Jersey the average initial wage of the group affected by the increase in the minimum wage grew by 10% and, contrary to expectations, employment increased; while in Pennsylvania – where the minimum wage remained unchanged – employment decreased. The authors found a similar

---

[7] The essence of the DiD – difference-in-differences – estimate is to compare the change observed in the group affected by the wage increase to change observed in a control group (with change in headcount or working hours). For an estimate to be valid, the group affected and the group not affected by the rise in the minimum wage must be essentially similar, i.e. the only difference between them should be whether the minimum wage was or was not increased.

result when they looked at the restaurants in New Jersey that were paying high wages (control group A): employment increased in the low-income sector affected by the rise in the minimum wage, whereas it declined in the control group. It should be noted that the decline in the control groups was, to a large extent, a consequence of the general economic downturn.

Accordingly, in this case the empirical findings totally contradict the hypothesis based on the classical theory, according to which a rise in the minimum wage should reduce employment.

One possible explanation may be that the negative impact of the minimum wage was offset by the growth in demand for fast-food restaurants (a positive demand shock). The authors explored this possibility as well, and they found that the market conditions were relatively constant within the regions covered by the study, making it fairly unlikely that the results had been caused by unexpected demand shocks. Another possible explanation was that restaurants cut non-cash benefits in response to the increase in the minimum wage. In the majority of cases, non-cash benefits mean discounted or free meals. Quite interestingly, however, non-cash benefits (the proportions of free meals) were increased, rather than cut in New Jersey. A third possibility was that the rise in the minimum wage would result in higher consumer prices. During the period under review, prices increased 3.2% faster in New Jersey than in Pennsylvania (that is control group B); however, no such difference was found between the low and high-income restaurants in New Jersey (i.e. in a comparison with control group A). The explanation for this is probably that restaurants in New Jersey were competing on the same geographical market, and this precluded any major difference between the prices. On the whole, the case study of Card and Krueger (1994) highlights the positive effect an increase in the minimum wage can have on employment, and shows that the main result of the wage increase was an increase in consumer prices.

Responding to criticism of the above study (most of which related to possible distortions resulting from telephone responses) Card and Krueger (1998) recalculated their results using a database supplied by the statistics office. This database is generated from official reports submitted by employers to the local labour office, and is the most reliable of the available data sources. The authors used a representative sample from this database covering the years 1992 and 1993. Their findings are very similar to those outlined above: in New Jersey employment grew at least as fast as in Pennsylvania during the period under review. By assessing a variety of model specifications (in essence, all the applied models use DiD methods, with various explanatory variables reviewing different groups of restaurants and measuring the change in employment in terms of persons or percentages) they came to the conclusion that the rise in the minimum wage probably had zero or only a modest positive impact on employment in the fast-food restaurant sector of New Jersey.

Machin and Manning (1997) surveyed four European countries, and they also found that increasing minimum wages had no negative impacts on employment. Their paper analysed the change in employment as a whole in a

breakdown by geographical units, with a special focus on low-income regions. The authors compared the period between the early 60s and the mid-80s to the period between the mid-80s and the mid-90s. According to their empirical findings, employment in low-income regions increased at a higher rate even during periods of substantial rises in the minimum wage.

Dolado *et al*. (1996) studied the impacts of the minimum wage by splitting the 80s into two periods. During the first half of the decade the minimum wage increased in relation to average earnings, while in the second half no significant rise was observed in the minimum wage. According to their empirical findings, the rise in the minimum wage had a negative impact on employment: during the first half of the 80s the minimum wage was one of the causes of high unemployment. During the second half of the decade, both the minimum wage and the unemployment rate declined somewhat. In evaluating the results, however, the economic conditions must also be taken into account. The period between 1981 and 1985 was one of recession, while the second half of the same decade was a boom period, a further reflection of which may have been visible in the changes in unemployment. To control for this factor, the period between 1967 and 1992 – which saw three substantial rises in the minimum wage – was also studied. The authors also looked at the group of low-income people separately, confirming the hypothesis that a rise in the minimum wage has the greatest impact where wages are lowest. In the period between 1967 and 1985 – when minimum wages increased quite substantially – employment also increased, but no such relationship could be identified during the period between 1985 and 1990. Accordingly, over a longer period of time no close negative relationship could be found between a rise in the minimum wage and changes in employment.

Dolado *et al*. (1996) studied the impact of the minimum wage on employment in two other European countries (Spain and the United Kingdom) using a time-series estimate based on aggregated data, from which the authors drew two important conclusions. Since between 1965 and 1995 the proportion of the minimum wage relative to the average wage did not change much in these two countries, it cannot be maintained that the growth in unemployment was caused by a rise in the minimum wage. Furthermore, the minimum wage was found to have a wide variety of impacts on employment. In some cases the minimum wage reduced employment (particularly among young people); in other groups it increased employment. The authors therefore concluded that it would not be easy to find strong evidence to support the assumption that a minimum wage reduces employment.

One of the analyses that cast doubt on the findings of the Card and Krueger (1994) study was published in an article written by Neumark and Wascher (1995), who studied the same case using the same method but a different database from the one used by Card and Krueger (1994). Neumark and Wascher argued that the database compiled for the original study was of inferior quality and that was the reason why the authors had found a positive impact on employment. Based on the data, which they interrogated using a

different method, they found significant negative impacts of the minimum wage on employment (instead of the 0.93 wage flexibility indicator estimated by Card and Krueger, they found a –0.24 wage flexibility).

Michl (1999) made an attempt to reconcile the two studies that had led to such contrasting findings, showing that both calculations had yielded correct results and the contrast between their findings was a result of their different definition of employment. Card and Krueger (1994) had used the number of employees (i.e. full-time job equivalent), while Neumark and Wascher (1995) had used the number of completed working hours as a dependent variable. Michl (1999) shows that it is possible to find a situation in which the number of employees does not diminish following an increase in the minimum wage, but rather the weekly number of working hours per employee – and thus the total number of working hours – is reduced. According to Michl, whether this should be regarded as a drop in employment depends on whether the question is asked from a theoretical or an economic-policy perspective. In theory, employment is indeed reduced; however, in practice, the same number of employees might work fewer hours than before, but probably for at least as much as they had earned before, which, on the whole, may result in growing social prosperity.

4.2. A minimum wage increase may have a negative impact on employment

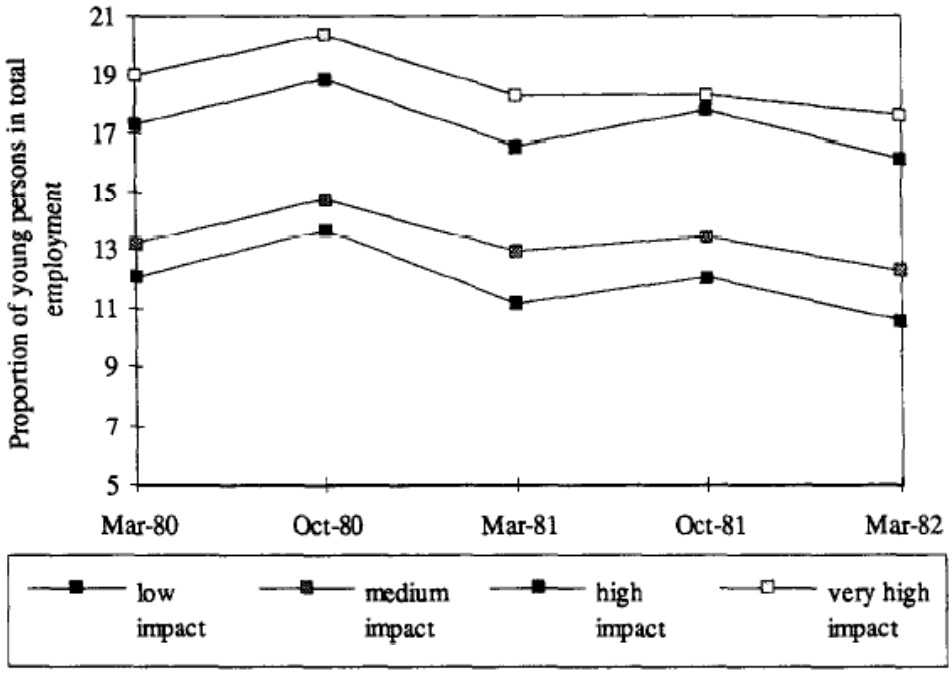
Quite a number of empirical studies show findings indicative of negative impacts on employment, for one or another specific group of people (e.g. Bazen and Skourias, 1997 for young people), or for cases of significant rises in the minimum wage (e.g. Pereira, 1999; Rama, 2000). Two of these studies are discussed in detail below.

The relationship between the minimum wage and employment has been the subject of particularly intense debate and extensive empirical research in France. The level of the minimum wage has been relatively stable, with no dramatic increases taking place. Some larger rises were introduced in 1968, 1973 and 1981, of which the 10% increase of 1981 has been the most frequently studied. Bazen and Skourias (1997) focused on the younger generation, which had been expected to be most affected. During the period under review – between March 1980 and March 1984 – the proportion of young people among all employees dropped from 14.6% to 12.9%. The important question is to what extent this decline was caused by the steady rise in the minimum wage during the period. The authors' main conclusion is that the 10% rise in the minimum wage did contribute to the drop in the proportion of young people within the total number of workers.

Bazen and Skourias (1997) set up the following four categories: the sector least affected (by less than 3%), the sector little affected (by 3% to 8%), the vulnerable sector (by 8% to 15%) and the sector very seriously affected (by more than 15%) by the increased minimum wage. The following figure shows

percentages for the above sectors within the total number of employees during the period under review.

Figure 5: Percentage of young people within the total number of employees



Source: Bazen and Skourias (1997).
Note: The percentages shown are average figures weighted for employment in the various sectors.

The March–October breakdown is the basis for regression applied in the model (the 10% increase in the minimum wage took effect in June 1981).

The basic specification of the model is as follows:

$$\Delta EY_t = \alpha MW_t + \beta \Delta \log(ET)_t + u_t$$

ΔEY_t: change in the proportion of young people employed (between March and October)

$\Delta \log(ET)_t$: change in the total employment percentage (between March and October)

MW_t: proportion of employees affected by the increase in the minimum wage.

To make their findings even more accurate, the authors also studied the annual difference in the changes occurring between March and October 1980 and the same months in 1981, using the difference-in-differences method. In this case the model specification is as follows:

$$\Delta_a \Delta EY_t = \gamma \Delta_a MW_t + \delta \Delta_a \Delta \log(ET)_t + v_t$$

where Δ_a means the annual changes.

Table 2: The impact of the minimum wage on the employment of young people

Result variable	Coefficient of the *MW* variable	t-statistics
Change that took place in employment before the increase in the minimum wage		
1. Percentage of change in employment between March and October 1981	0.051	2.17
Difference-in-differences (DiD) method		
2. Percentage of change in employment between March and October 1980 and March and October 1981	–0.124	2.91
3. Percentage of change in employment between March 1981 and March 1982	–0.040	2.46
4. Percentage of change in employment between March 1980 and March 1984	–0.174	4.11

Source: Bazen and Skourias (1997).

Regression shows a definitely negative relationship between a minimum wage and the employment of young people. The results are presented in *Table 2*, and special attention should be paid to the second row (regression according to the above model specification). The coefficient of variable *MW* (the proportion of those influenced by the minimum wage) is negative and significant, i.e. the larger the increase in the percentage of those affected by the minimum wage between 1980 and 1981, the smaller the growth in employment of young people in the given sector. The question is whether this relationship can be observed over a longer period of time. The authors also arrived at a similar result when they estimated the above regression for the period between 1980 and 1984: again, the impact of the minimum wage was found to be negative and significant (row 4 in *Table 2*).

The example of Portugal (Pereira, 1999) also confirms the above findings, i.e. that a rise in the minimum wage has a negative impact on employment among the youngest generation. A relatively unexpected and large-scale increase was introduced on 1 January 1987 in Portugal: employees in the 18–19 age group were granted entitlement to the adult minimum wage by law, resulting in a 49.3% wage increase for this category of employees. Since the change was unexpected and quite big, its impacts on the wage level and on employment are easy to analyse. The author applied a method that was similar to the one used in the Card and Krueger (1994) study: comparing the wage and employment data for the age group affected by the rise in the minimum wage to the corresponding data for the 20–25 and the 30–35 control age groups. The model specification is as follows:

$$\Delta Y_{ijt} = \alpha + \beta d_i + \gamma X_{jt} + \varepsilon_{ijt}$$

where ΔY_{ijt} means the change in employment of the i^{th} age group working for the j^{th} employer before and after the increase, the X vector comprises company-specific variables, and the value of the dummy variable d equals 1 in the case of the 18–19 age group affected by the minimum wage increase and 0 in the case of the control groups. The parameter of interest, the one to be estimated, is β. If this parameter significantly differs from zero, the increase in the minimum wage has an impact on employment; otherwise there is no such impact. The results show a definitely negative and significant impact, as presented in *Table 3*.

Table 3: Impact on the number of employees

Age groups	1986–87	1986–88	1986–89	1985/86–1988/89	1985/86–1987–89
18–19 and 20–25 age group	–0.087**	–0.196**	–0.223**	–0.202**	–0.173**
	(0.020)	(0.033)	(0.041)	(0.041)	(0.036)
18–19 and 30–35 age group	–0.025	–0.107**	–0.010	–0.100	–0.087
	(0.020)	(0.033)	(0.056)	(0.062)	(0.055)
20–25 and 30–35 age group	0.063**	0.089**	0.212**	0.102	0.086
	(0.023)	(0.037)	(0.059)	(0.064)	(0.057)

Source: Pereira (1999).
Note: The estimated variance of the parameter is presented between brackets – being the significant parameter values at 1%.

Comparing the rate of employment in the 18–19 age group to that in the 20–25 age group shows a definite decline (the coefficient is negative in each box in the top row of the table). In the case of the 30–35 age group (second row) the coefficients are negative in each case, though their absolute value is smaller. The results in the third row show a change in the employment of the two control groups: employment in the 20–25 age group increased at a higher rate than in the 30–35 age group in each of the periods under review. In this case, therefore, the results show a kind of substitution effect: the rate of employment in the 20–25 age group increased at the expense of the employment of people in the 18–19 age group.

In summary, a few clear-cut trends may be discerned in the wide-ranging empirical findings. Emphasis has shifted from assessment of negative impacts on employment to the question of whether there are any impacts at all. In the case of the increases in the minimum wage reviewed here, it is possible to identify negative impacts on the employment of people belonging to the youngest generation, but no negative impacts on employment in general. The studies described above are summarized in *Table 4*.

Table 4: Studies exploring the impacts of a minimum wage on employment

Study	Rate of minimum wage increase	Groups under review	Method applied	Impact identified
Katz and Krueger (1992)	9% increase (from $3.81 to $4.25)	Employees of fast-food restaurants in Texas, USA	OLS estimate based on wage gap	Positive
Card and Krueger (1994)	18.8% increase (from $4.25 to $5.05)	Employees of fast-food restaurants in New Jersey, USA	Difference-in-differences (DiD) method	Significant positive (0.93 flexibility)
Card and Krueger (1998)*	18.8% increase (from $4.25 to $5.05)	Employees of fast-food restaurants in New Jersey, USA	DiD method	Neutral or slightly positive
Machin and Manning (1997)	Repeated increases between 1960 and 1990	All employees in France, the Netherlands, Spain and England	Regression to see relationship between change in employment and change in wage, on panel of regions	Neutral (mixed); in Spain substitution from younger towards older generation
Dolado *et al*. (1996)	Repeated increases between 1960 and 1990	All employees in France, the Netherlands, Spain and England	Regression between change in employment and Kaitz index	Mixed, negative impact on employment of young people
Neumark and Wascher (1995)*	18.8% increase (from $4.25 to $5.05)	Employees of fast-food restaurants in New Jersey, USA	DiD method	Significant negative (–0.24 flexibility)
Michl (1999)*+	18.8% increase (from $4.25 to $5.05)	Employees of fast-food restaurants in New Jersey, USA	Theoretical model	The impact depends on definition of employment
Bazen and Skourias (1997)	10% between 1980 and 1984	Young people, France	DiD	Significant negative (–0.17 flexibility)
Pereira (1999)	43.9% increase for employees	18–19 age group, Portugal	DiD	Significant negative

Study	Rate of minimum wage increase	Groups under review	Method applied	Impact identified
	aged 18–19	group, Portugal		negative
Kertesi and Köllő (2004)	from HUF 25,500 to HUF 40,000	SME sector, Hungary	DiD 3SLS method	Significant negative (–0.27– –0.32)

Notes: The findings of the Kertesi and Köllő (2004) study are presented in Section 5. *Recalculation of Card and Krueger (1994) + Recalculation of Neumark and Wascher (1995).

4.3. Impact of minimum wage on income inequalities

One of the purposes of the minimum wage may be to improve the position of people living in poverty or those living close to the poverty line. In the case of a large part of the debates and the empirical impact assessments relating to the minimum wage, however, emphasis is shifted toward the impacts on employment, while impacts on redistribution are often disregarded. Though exploring the impacts on employment is very important, this alone is not sufficient to provide a satisfactory answer as to changes in the income positions of families. As was shown by Neumark and Wascher (1997), leaving aside the number of people who have lost their jobs following a rise in the minimum wage, the income levels of the families in which such individuals live should also be explored. For many minimum wage earners do not belong to the poorest groups in society, and the growth of the minimum wage does not in itself provide information on changes in the average incomes of poor families.

The minimum wage does not play a definite role in reducing poverty or income inequalities, for the poorest families do not typically have any labour income at all. According to an OECD study (OECD, 1998) some 80% of those working for the minimum wage in the member states were people on a medium or high per capita income. Likewise in Hungary, instead of poor households, the majority of minimum wage earners live in households that fall within the middle third in terms of household income (see subsection 5.4).

Finally, the employment impacts of a minimum wage increase are usually estimated with respect to the whole population, without providing direct estimates of the impacts on people earning the minimum wage, despite the fact that such an increase probably has rather different impacts on workers in different positions. This subsection discusses international empirical findings concerning income distribution.

Neumark and Wascher (1997) studied this question in detail on the labour market of the United States of America. A review of a one or two-year period in the case of low-income families with active earners, both before and after an increase in the minimum wage, shows that such families have an increased chance of seeing their earnings grow above the poverty line. At the

same time, as a consequence of the negative impacts of the rise in the minimum wage, the number of wage earners may drop in certain families, thus increasing the likelihood of their becoming poor. On an aggregate level, these impacts more or less offset one another. From this, the authors conclude that the minimum wage is much more of a tool influencing income distribution among the poor, than it is a measure channelling income from the rich toward the poor. An assessment of the longer-term impacts shows, however, that the labour market adapts itself to an increase in the minimum wage in a variety of ways – by modifying the wage level, the number of employees and the number of working hours; by changing the composition of the workforce, etc. – as a result of which the impact of the rise in the minimum wage on income turns negative. Furthermore, the (negative) employment impacts of an increase in the minimum wage are focused on low wage earners, which also undermines the argument that a rise in the minimum wage improves the income position of this social group.

Addison and Blackburn (1998) came to the opposite conclusion when they assessed data recorded in the US between 1983 and 1996. They found that, as opposed to what happened in the 80s, minimum wages did help alleviate poverty during the 90s, especially among young people who had dropped out of secondary education. The authors explained this in part by arguing that, in assessing the impact on income distribution, previous studies had often relied on assumptions – for the want of clear-cut theoretical conclusions – concerning the impact of the minimum wage on employment, for example by using job loss rates taken from other studies. Furthermore, the authors found that this positive impact during the period cannot be explained either by improvements in labour market prospects or by an increase in the ratio of people with higher qualifications within the total labour supply. The first of these arguments is countered by the fact that the period 1990–96 began with an economic downturn, and consequently labour market prospects were hardly promising. The second point is refuted by the authors' empirical findings: the results of the OLS estimate based on state level (panel) data do not show any increase in the proportion of people with higher qualifications in the labour supply.

Based on their assessment of long-term impacts, Neumark and Nizalova (2004) point out that a statutory minimum wage usually has a negative impact on the employment of the youngest generation on the labour market, and that this may have serious long-term implications as a consequence of less experience on the labour market and reduced willingness to work. They consider that people who take up employment in their younger years on a labour market with a higher minimum wage will be less likely to continue their studies, and since the high minimum wage results in longer periods and a higher frequency of unemployment, they will be more likely to get involved in illegal activities. The authors also note that a reverse relationship is likewise possible – young people forced out of the labour market may decide to continue with their studies. Neumark and Nizalova (2004) developed indicators to track over the past 30 years the amount of the state minimum wage (vis-à-vis the federal minimum wage) and the length of time over which it was payable to

people in the USA in the age group 16–29, estimating the impact on their employment (number of working hours completed) and their wages. The authors found that the wages of teenagers are increased and those of people in the 25–29 age group are reduced when there is a relatively high minimum wage. In states that had introduced high minimum wages, people in the 25–29 age bracket earned 3% less. By contrast, the authors found no significant relationship between the minimum wage paid to young people and their employment levels.

If the role played by trade unions is also taken into account, it is found that an increase in the minimum wage has opposite impacts on low-income employees, depending on whether or not they belong to trade unions. The results show that trade union members gain from increases in the minimum wage at the expense of non-members ((Neumark, Schweitzer and Wascher, 2000).

By reviewing other means of redistribution, Neumark and Wascher (2000) found that a negative-tax support is much more effective in improving the income position of those living below the poverty line than a minimum wage. They found that an income-dependent tax credit/support (*Earned Income Tax Credit*, which in the US means a wage subsidy below a certain income level, and tax relief above it) results in improvement primarily by stimulating families without active earners.

Based on their analysis of the British labour market, Manning and Dickens (2002) offer a new solution to the problem of missing data in relation to wages.[8] The authors show that earlier studies had been based on false assumptions, which led to a 50% overestimation of the numbers of those affected by the increase in the minimum wage. On the basis of simple assumptions, the authors arrived at a number of new conclusions. The relationship between low wage-income and poverty seems to have grown stronger over recent years, so minimum wages might perhaps play an increased role in reducing poverty. At the same time, as the authors point out, the most one can say on the basis of the data is that the minimum wage has an uncertain impact on income distribution. By reviewing differences between the wages of men and women, they found that the introduction of a minimum wage reduced the inequality between the average earnings of men and women by some 0.3–0.4%.

From their assessment of Latin-American countries Maloney and Mendez (2003) concluded that an increase in the minimum wage has a substantial impact even on people working for much more than the minimum wage, and that this impact is more substantial than was found by Neumark and Wascher (1997) in the United States of America, i.e. an increase in the minimum wage has a more substantial impact in these countries on the whole of the income distribution regime. The authors explain this by the much higher degree of labour market inflexibility in Latin America.

---

[8] In the United Kingdom the minimum wage applies to hourly rates. However, no precise data on hourly rates are available for some 40% of employees.

Saget (2001) reviewed the impact of minimum wages on poverty in developing countries, relying on the ILO database. In the case of groups defined on the basis of a variety of poverty lines (e.g. the national poverty line or the number of those living on 1 or 2 dollars a day), the author found that a minimum wage significantly reduces the number of people living below the poverty line, even if the effect of the average wage increase is eliminated. This conclusion corresponds to those of studies by the OECD (1997, 1998), which found that a high minimum wage is usually accompanied by a lower poverty rate – and vice versa. This relationship was explained by the OECD on the principle that this macro-level relationship shows the general state of the society – i.e. a lower level of inequality is rooted in institutional agreements – and does not necessarily mean that an increase in the minimum wage would reduce poverty.

4.4. Other impacts of an increase in the minimum wage [9]

On the subject of the effects of increases in the minimum wage on employment, it is often argued that employers try to offset the cost-increasing impacts of a rise in the minimum wage by lowering the standards of labour safety and by cutting training expenditure (Simon, 2003).

In the United States of America, 25% of all benefits are extra-wage benefits, of which 15%points are voluntary, i.e. companies can, in theory, implement increases in the minimum wage at the expense of such benefits. This option, however, is limited by a variety of factors. The US federal tax law guarantees tax exemption for certain types of extra-wage benefits (e.g. health insurance) and tax relief for others (pension contributions), but only if the levels of benefit are not set by the employer on an individual basis. Accordingly, it is not possible to set the amounts of the extra-wage benefits freely, for each individual employee, and it is not likely that enterprises would adjust the general system of benefits to the relatively small percentage of employees working for the minimum wage (i.e. adjusting downwards), thereby damaging the standing of groups of employees earning higher wages (Simon, 2003).

Labour safety is, to a significant degree, a public good within the enterprise, shared by the various employee groups (employees who have become 'too' expensive as a result of a minimum wage increase cannot be excluded from it). The rest of the extra-wage benefits, such as paid holiday entitlement and sickness benefit, can be provided in a highly flexible way, adjusted to the individual employee.

A look back over 25 years in the USA reveals a decline in extra-wage benefits in both the marginal and the core groups of employees. This is an indication of the existence of a trend – which is independent of the development of minimum wages – of declining generosity by employers in this

[9] We extend our thanks to László Szabó for his valuable contribution to this section.

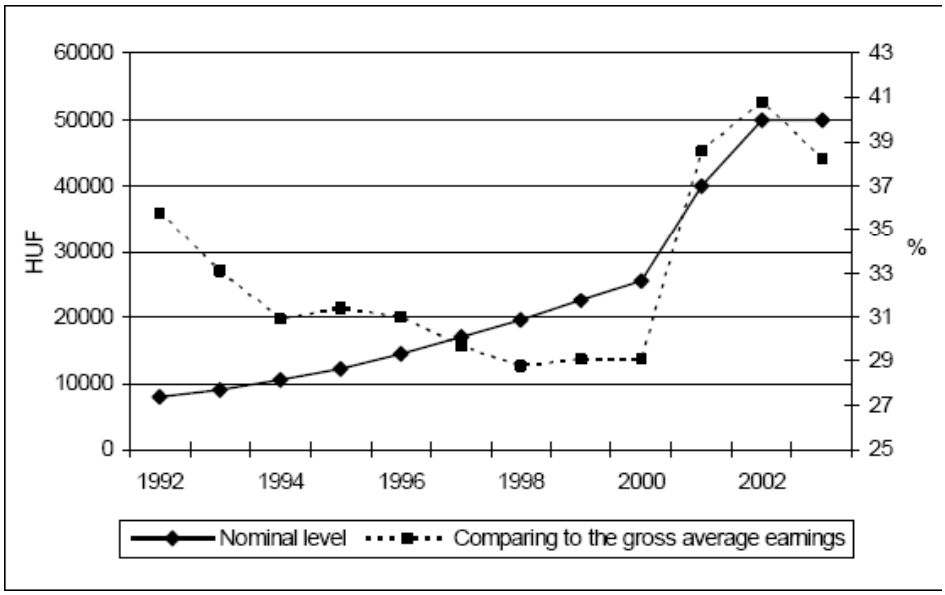
field. Simon (2003) found no negative relationship in his analysis over time between the minimum wage and the extra-wage benefits.

Based on a review of the impacts of a minimum wage on the informal and the formal sectors, the study by Maloney and Mendez (2003) concludes that a minimum wage may have a 'lighthouse' effect on wages in the informal sector, i.e. that the minimum wage is a reference point for the whole of the economy. Moreover, the minimum wage has a stronger impact on wages in the informal sector than in the formal. Thus the traditional theory – by which flexible wages are the feature of the informal sector that allow it to absorb labour forced out of the formal sector by inflexible wages – does not hold water. As well as being more efficient than the formal sector, the informal sector can also bypass regulations and costs. The findings of regression analyses show that a rise in the minimum wage has a negative impact on the employment of people working in the informal sector as well.

5. The Hungarian experience

A very substantial rise in the minimum wage was introduced in Hungary in 2001–02. The government then in office practically doubled the minimum wage in a two-year period, first increasing the monthly wage on 1 January 2001 from HUF 25,000 to HUF 40,000, and then in January 2002 increasing it further to HUF 50,000. As a consequence of this measure, the minimum wage/average wage ratio (Kaitz index) rose dramatically – to 43% in 2002 – though it still remained below the OECD average (Kertesi and Köllő, 2005). The growth in the minimum wage and its ratio to the average wage is shown in *Figure 6.*

Figure 6: Growth in the amount and proportion of the minimum wage in comparison to the average wage 1992–2003 (HUF, %)



Source: Kézdi *et al*. (2004).

The consequences of this drastic labour market measure have been reviewed in numerous studies, and most analyses of the domestic effects of the minimum wage are related to it.

The first analyses based on descriptive statistics assessed the group(s) of employees whose wages were in need of adjustment. According to the calculations of Popper (2002), the first increase directly affected about a quarter of the people working in the private sector, while the second increase affected a third of them. The wage increase prescribed by law applied to 47–59% of people working in the textile and the leather industries. According to Palócz and Tóth (2003) the statutory minimum wage prompted wage increases primarily in the service industry and in businesses employing small numbers of people.

On the basis of their review of capital and labour expenditure between 1992 and 1999 at enterprises with more than 300 employees, Kertesi and Köllő (2002) predicted significant drops in employment as a consequence of the increases in the minimum wage, for they would result in growing costs primarily in labour-intensive sectors and those enterprises employing people with low qualifications. It is in this very group of employees that capital can best take the place of labour (Kertesi and Köllő, 2002), and consequently factor substitution and a reduction in employment was more likely to be the outcome of a wage increase that affected the bottom of the wage scale, than price rises in a competitive market.

The ex-post impact assessments of the increase in the minimum wage based on micro-level data focused on the impacts on employment and the budget. The findings of such assessments are described in the following two subsections. The third subsection explores the impacts of the increases in 2001 and 2002 on the distribution of incomes: whether they improved the situation of the poor or not.

5.1. Impacts of the rise in the minimum wage on employment in Hungary

A paper produced by Kertesi and Köllő (2004) may perhaps be the most widely known analysis of the impact on employment. The authors reviewed only the impact of the wave of minimum-wage increases in 2001, primarily in the sector of small enterprises, assessing the chances of employees losing their jobs and of unemployed people finding employment. The key conclusion drawn by the authors in the paper is that the increase in the minimum wage resulted in a substantial reduction in employment opportunities in the small enterprise sector.

The authors argue that the employment shock was caused not by the increase in the minimum wage itself, but rather was triggered by its ripple effect on the average wage: not only did employers raise the pay of people who used to earn less than the new minimum wage, but they also increased the

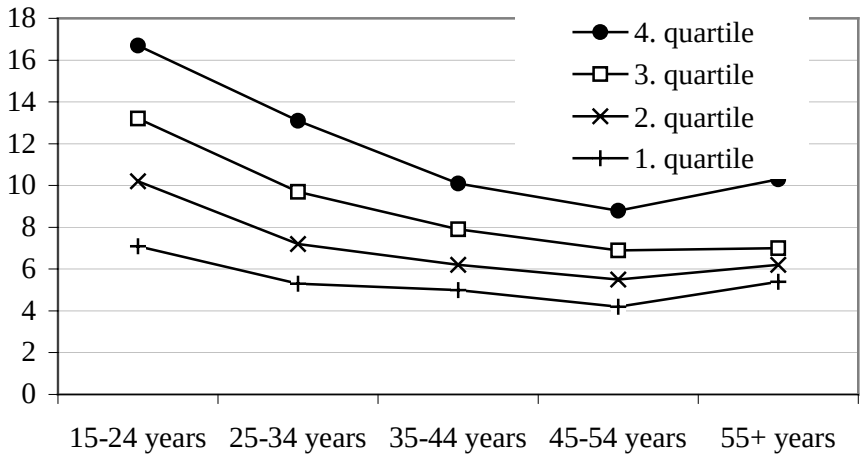
wages of people who had been earning more than the minimum wage, in order to maintain wage differentials.

Accordingly, the extent of the wage shock was measured by the authors using the following formula for the wage-gap, instead of the indicator – the ratio of employees earning less than the minimum wage (F) – more usually applied in technical literature:[10]

$$\omega = \frac{w^* F + w_H (1-F)}{w_F F + w_H (1-F)}$$

where F is the percentage of people who used to earn less than the new minimum wage, w_F is their average wage before the increase, w_H the average wage of the rest of the employees, and w^* is the new minimum wage. The wage shock was calculated by the authors for regions that were assigned to different groups according to their standing. The regions were grouped together according to the local unemployment rates; the local unemployment rates are lowest in the first quartile and are highest in the fourth quartile.

Figure 7: Average rate of the wage shock (ω) *among people who have completed primary school, by group of regions, %*



Source: Kertesi and Köllő (2004), p. 300.

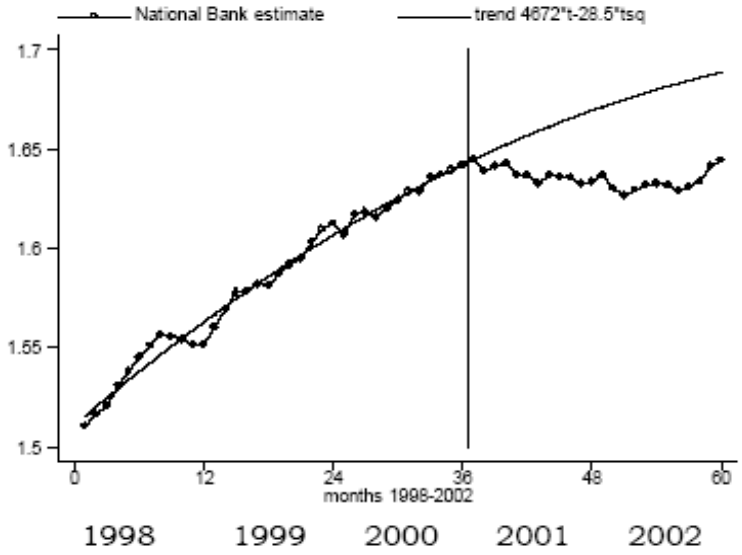
Figure 7 shows that the wage shock was greatest among young people, unskilled people, and those living in regions with high rates of unemployment. For example, in the group of people aged below 24 years, with poor education and living in the most disadvantaged regions (4th quartile) the average wage

[10] The authors' explanation is that this formula provides the 'wage-gap' that has to be filled by employers on the day the rise in the minimum wage takes effect. The indicator ω presented here is used instead of the more frequently applied F – that is, the proportion of people earning less than the minimum wage – because ω reflects information resulting from the wage level before the rise in the minimum wage.

increased by 16.7% after the increase in the minimum wage, while the average wage of people with further education degrees increased by only 1%.

The aggregated data show that, though there is no decrease in employment in absolute terms, the rise in the minimum wage broke the earlier trend of increasing employment (*Figure 8*).

Figure 8: Trends in employment between 1998 and 2002, the impacts of the rise in the minimum wage



Source: Kertesi and Köllő (2004).
Note: Seasonally adjusted monthly levels, in millions of persons, without agriculture and the public sector, CSO Labour Survey, Hungarian National Bank adjustment.

A similar interpretation is provided by Kézdi *et al*. (2004): they hold that the expected significant negative employment impacts of the rise did not materialize and no significant drop occurred, apart from seasonal impacts on employment.

An econometric analysis of micro-data in the small enterprise sector, however, showed a highly negative impact on employment there. Kertesi and Köllő (2004) estimated the impact on employment using the following method. Since the number of employees and the wage level influence one another, the first step was to assess these using independent factors. For this reason, as a first step they estimated the trend in the wage level on the basis of the aforementioned wage shock, the region's unemployment situation, and the profile of the enterprise during the earlier period. The significance of this lies in the fact that these explanatory variables are independent of the trends in headcount, and consequently their use does not distort the results. The wage trend that was estimated in this independent way could then be used to estimate the change in employment. The following model was estimated in a formalized way using the 3SLS method:

$$\Delta \ln(w)_i = \beta_0 + \sum_{j=1}^{4} \beta_{1j} \left\{ \ln(\omega)_i \cdot U_{ij} \right\} + \beta_2 \pi^0 + u_i$$

$$\Delta \ln(L)_i = \alpha_0 + \alpha_1 \Delta \ln(q)_i + \alpha_2 \Delta \ln(w)_i + \alpha_3 \ln\left(\frac{K}{L}\right)_i^0 + \alpha_4 X_i + \nu_i$$

where $\Delta \ln(w)$ is the change in labour cost in real terms, ω the wage-gap defined earlier, U_j the region quartile dummies, L, q, and w are headcount, output and real average wage at the company; $\Delta \ln(q)$ is the change in the sales revenue in real terms; $(K/L)^0$ is the capital/labour ratio in the base period; π^0 is the profit of the base period; X contains industry and region dummies.

The estimated flexibility of the labour cost with respect to the wage shock varies between 0.65 and 0.77, depending on the regional unemployment levels. The labour cost flexibility of employment is –0.41. Accordingly, the indicator that is the product of the multiplication of these flexibility figures, i.e. the drop in headcount caused by the wage increase, varies between –0.32 and –0.27: in other words, *a 1% wage increase resulted in a 0.27–0.32% drop in the number of employees*, with regions of higher unemployment being hit harder.

According to Kertesi and Köllő (2004), as a consequence of the rise in the minimum wage employment dropped by at least 3.5% between 2000 and 2001 in the group of small enterprises with 5–20 employees, and the impact was stronger in regions that had been in a worse position before the change. The authors reviewed the likelihood of people losing their jobs as a result of the rise in the minimum wage, and found that people on the minimum wage were twice as likely to lose their jobs as those with slightly higher pay, and that, in 2001 and then again in 2002, the chances of the low-earning unemployed finding jobs decreased substantially.

According to the model calculations of Halpern *et al*. (2004) – who also took macro-level interactions (which are discussed in the next subsection) into account – as a consequence of the rises in the minimum wage introduced in 2001 and 2002, employment dropped by 1.3–2.3 percentage points more than would have been the case if the minimum wage had been raised by only the rate of inflation. This decline affected only unskilled people, and the loss calculated for this group was as high as 2–4 percentage points. The first increase in the minimum wage did not result in any material increase in government revenues, whereas expenditure did increase.

According to Köllő (2001), the model underlying the calculations identifies three different types of employee (unskilled, young skilled and older skilled). The level of employment is determined by different factors in the cases of skilled and unskilled people. The equilibrium employment level is determined on the market of unskilled labour by demand and the minimum wage, while, on the market of skilled labour, it is determined by demand and the inflexible supply. As a result of an increase in the minimum wage, the employment of unskilled labour declines: the higher the minimum wage, the

less worthwhile it is for the employer to employ unskilled people. The higher the proportion of 'grey' enterprises, the more substantial is the fall. This is explained by the fact that, for grey enterprises, a rise in the minimum wage results not only in higher wage costs, but also in increased average tax burdens. The model assumes that unskilled and skilled labour complement one another, while younger and older skilled labour substitute one other.

Our own calculations based on aggregated data originating from PIT returns submitted to the Tax and Financial Control Administration (APEH) also reveal a drop in employment. In 2000 a total of 3.1 million people reported an annual labour income equalling at least the minimum wage, while in 2001 and 2002 the corresponding figures were 2.9 million (7% down) and 2.8 million (11 % down).

The aggregated data also show that employers did not necessarily increase the pay of people earning less than the new minimum wage to the new minimum amount. In 2000 a total of 637,000 people reported annual labour income below the amount of the 2001 minimum wage; of these, 175,000 earned the 2000 minimum wage. In 2001 however, only 230,000 people were paid the annual amount of the new minimum wage, and at the same time the number of people earning more than the 2001 minimum wage grew by only 200,000. A comparison of the 2000 data against the 2002 minimum wage reveals a similar picture (*Tables 5.a and 5.b*). The conclusion is that, while the total number of people who filed tax returns for at least the amount of the annual minimum wage declined, the proportion of those earning the amount of the minimum wage increased, i.e. the flexibility of the labour market probably diminished.

Table 5/a: Number of people reporting income equalling the current minimum wage, falling between the previous and the new (2001) minimum wage, and those reporting income above the new minimum wage, based on the aggregated data of PIT returns

	2000	2001
number of people earning about the minimum wage	175 512	226 485
number of people earning between the 2000 and the 2001 minimum wage	462 277	
number of people earning more than the 2001 minimum wage	2 468 112	2 667 045
Total	***3 105 901***	***2 893 530***

Notes: i) Only those reporting annual labour income in excess of the minimum wage were taken into account; ii) minimum wage in 2000: HUF 306,000 p.a.; in 2001: HUF 480,000 p.a.; iii) the number of those earning between the 2000 minimum wage and the 2001 minimum wage is based on the amount of the 2001 minimum wage converted into the 2000 value; iv) in determining the number of people earning more than the 2001 minimum wage in the figure for 2000, the 2001 minimum wage at its 2000 value was taken into account.

Table 5/b: Number of people reporting income equalling the current minimum wage, falling between the previous and the new (2002) minimum wage, and those reporting income above the new minimum wage, based on the aggregated data of PIT returns

	2000	2001	2002
number of people earning about the minimum wage	175 512	226 485	223 261
number of people earning between the current and the 2002 minimum wage	700 170	129 488	
number of people earning more than the 2002 minimum wage	2 230 219	2 537 557	2 551 221
Total	***3 105 901***	***2 893 530***	***2 774 482***

Notes: i) Only those reporting annual labour income in excess of the minimum wage were taken into account; ii) minimum wage in 2000: HUF 306,000 p.a.; in 2001: HUF 480,000 p.a.; in 2002: HUF 600,000 p.a.; iii) the number of those earning between the current minimum wage and the 2002 minimum wage is based on the amount of the 2002 minimum wage discounted to the year concerned; iv) in providing the number of people earning more than the 2002 minimum wage the discounted values were again taken into account.

Kertesi and Köllő (2005) highlighted the fact that in Hungary the proportion of people earning about the minimum wage is very large compared to other OECD member states. As a consequence of the 2001 rise in the minimum wage, the number of people earning amounts of between 95% and 105% of the minimum wage rose from the previous 5% – which equalled the OECD average – to 10%, and then 15.4% in the wake of the 2002 increase, which was a very high figure among the OECD member states. Our calculations show that, though this percentage has declined, in May 2004 it was still above 11%, reducing the adaptability of the labour market. Kézdi *et al*. (2004) noted, as a positive feature, that inequalities were substantially reduced by such an increase in the proportion of people earning the minimum wage because the average income of the poorest tenth of wage earners increased from 46% to 53% of the median income. It should be noted here, however, that this comment applies only to people who earned some wage after the rises in the minimum wage, and thus most of the people in the poorest groups of the population were not affected by the change at all.

5.2. Budgetary impacts of the minimum wage increase

Halpern *et al*. (2004) studied the impacts of the 2001 and 2002 rises in the minimum wage in a static general equilibrium model calibrated to 2001 data. One advantage of the model is that it is suitable for measuring the impacts on budgetary revenue and expenditure simultaneously, and at the same time it partly measures the impact of the grey economy as well. In this model the grey economy only appears on the labour market because some businesses report their employees to be earning just the minimum wage (on which they pay taxes

and contributions) and then supplement the employees' income by paying them in cash, unofficially. The key conclusion drawn from this model is that, setting aside certain realistic assumptions concerning the operation of the economy, raising the minimum wage reduces (or impedes the growth of) employment and increases the budget deficit.

According to the calculations, government revenue can increase only if the proportion of the grey economy does not change as a consequence of the rise in the minimum wage. Growth originates from PIT and contribution revenues: a higher minimum wage increases the contributions paid by unskilled workers and people reported as earners of the minimum wage. This is partly offset by the following two effects: a drop in employment among unskilled people and a reduction in the pay of skilled employees. This latter is the result of an indirect effect. As a consequence of the increased wages of unskilled employees, production grows more expensive and prices go up. Higher prices produce a fall in demand, which leads to reduced demand for labour. In this way, therefore, the demand for skilled labour falls, and the falling demand causes the wages of skilled workers to shrink. The higher the proportion of grey employers the larger the increase in the government's revenue will be; at the same time, though, the wage elasticity of demand for labour diminishes. Consumption falls as a result of the price increase, and thus the revenue from consumption taxes remains largely unchanged. As higher contributions eat into the profits of businesses, they simply counter this by slightly increasing the proportion of grey employment.[11] As a consequence of this potential reaction, the government's revenue does not increase.

The model manages government expenditure by fixing the expenditure in real terms, and thus its nominal value can change only as a consequence of price changes. Most businesses build wage-cost increases into their prices, so consumer prices go up in the majority of economic sectors. Expenditure, however, grows at a slower rate than the average price increase, for the government purchases primarily services (where the proportion of skilled labour is high and so producer prices are not increased so much by rises in the minimum wage). Expenditure grows faster if the proportion of the grey economy is large, because in this case the tax-increasing effect of the minimum wage is higher and prices grow faster.

The budget deficit diminishes as a combined result of the above opposite impacts only if the proportion of grey employers is fixed or very low (not more than 10%) or very high (at least 60%; for details see *Tables F.2–3* in the Appendix). The authors did not review the factors that these limits are sensitive to. An ever more important conclusion is that if, in response to an increase in

[11] The profit rate is not substantially reduced by the increase in the minimum wage because the majority of businesses can incorporate wage costs in their prices. This varies by sector: it is typical of enterprises employing unskilled labour, for they face no import competition; however, light industry is an important exception to this. Reduction in the profit rate can also be offset by a small increase in the proportion of grey employers.

the minimum wage, some businesses start paying 'grey wages', contribution revenues will not increase and the balance of the budget will deteriorate.

The model includes a number of initial assumptions, the application of which may be justified (to make calculations possible or owing to the limitations of the data sources) though they may also distort the results of the study. One such assumption is that the supply of skilled labour is fixed. If the skilled labour supply is flexible (even in the short term), employment will decline more and the wages of skilled employees will decline less. This may lead to a further reduction in employment due to the growth of prices and the reduced demand on the market.

Beyond the labour market, the grey economy vanishes, and grey profit and grey income are lost from the model in the sense that these cannot be 'greyly' spent, as well as in the sense that there is no grey turnover in the market. This is a problem especially if grey demand is product specific – and it probably is, e.g. it is probably smaller in the case of durable consumer goods and guaranteed services, and larger in other services. Consequently, the model shows a higher degree of price adaptation than is realistic in sectors spared from export competition, and so it overestimates the decline in employment as well.

5.3. Debate over the impact of the increases in the minimum wage in 2001 and 2002: did employment decline?

Those taking part in a debate organized by the Ministry of Finance[12] agreed that, though the 2001 and 2002 rises in the minimum wage were not followed by any major decline in employment, this is true only when the national economy is viewed as a whole. In order to measure the actual impacts, sectoral, corporate and individual level data have to be assessed and instruments (models) suitable for eliminating the effects of other factors must be used. Some argued that impact assessments had not fully taken account of the impact of the macroeconomic environment. For, owing to diminishing external demand, an increasing real exchange rate and certain other factors, corporate profitability deteriorated steadily between 2000 and 2002,[13] which in itself could have been enough to cause employment to decline (Gábor Kátay and Mihály Kovács). The 1–1.5% drop in employment established by assessing the impact of the 2001 rise in the minimum wage is in contrast to the preceding trend of growing employment, but such an expansion could not have continued anyway on account of the macroeconomic trends in Hungary (Mihály Kovács).

---

[12] László Halpern, János Köllő and Péter András Szabó delivered presentations at the debate on 1 December 2005 entitled 'Expected impacts of the minimum wage in 2006', while Gábor Kátay, Gábor Kézdi and Mihály András Kovács attended the meeting as invited contributors.

[13] This is also confirmed by corporate profitability ratios calculated by the Hungarian National Bank, which were not presented at the debate: the data originate from a corporate panel based on APEH data, and they show a steady decline between 1999 and 2001.

Longer time series show that the growth of wages may also be substantially influenced by factors that are independent of the minimum wage. Real labour costs were growing faster than productivity even back in 2000, and the wage component, which was relatively low even by the standards of other Eastern European countries, had started to increase in 1998 after a long period of decline. A decline in employment can clearly be demonstrated in some branches of the manufacturing sector (explained by growing wage costs and external shocks), but this was balanced by a dynamic growth in services, and there was no dramatic fall in employment (Gábor Kátay).

Those attending the meeting did not question the importance of other factors, but some of them did note that the impact assessments carried out so far did not prove that external factors alone could explain the decline in employment in the manufacturing sector. On the one hand, a model that also explicitly contains the minimum wage is required in order to separate out the impact of the macroeconomic environment on employment, and it is not enough just to demonstrate that external shocks alone can determine trends in employment (László Halpern). On the other hand, the impacts of the earlier rise in the minimum wage were assessed on the basis of the observed data and the estimates measured the change in employment on the basis of fixed output; accordingly, the 1–1.5% measured is not a decline relative to a trend, but is an actual decline (measured with other factors eliminated). Furthermore, the impact assessment was based on data from *May* 2001, when the decline in external demand had not yet started (János Köllő).

The experience of other countries also confirms that it is highly unlikely that such a large rise in the minimum wage would not have a negative impact on employment. Although there are numerous theoretical models in which it is possible for an increase in the minimum wage not to reduce – and indeed even to increase – employment, in empirical literature one finds that large rises in the minimum wage always have negative (or at least not positive) impacts (e.g. Pereira, 1999; Rama, 2000; Maloney and Mendez, 2003). The much quoted exception is the paper by Card and Krueger (1994) on the New Jersey case, but later papers based on recalculations of their results have refuted the positive impact described in the original article (Neumark and Wascher 1994, 1995)[14] (János Köllő).

5.4. The impacts of the 2001 increase in the minimum wage on income distribution

The minimum wage increases introduced in 2001 and 2002 were welcomed by Hungarian society.[15] This was probably a consequence of a widely held belief

[14] Section 3 discusses the relevant empirical literature in detail, including the debate about the positive impact on employment measured in New Jersey.

[15] 'The majority (81%) of the Hungarian population supports the idea of a substantial – almost 85% – increase in the minimum wage, despite the fact that most people are aware of the potential negative impacts of such a major government intervention … Older people, people

that the minimum wage was linked to poverty and that assumed a rise in the minimum wage would reduce poverty.[16] Some consideration should be given, therefore, as to whether a rise in the minimum wage can really be regarded as an effective social policy instrument, i.e. whether the increase actually affects families and individuals in need, and so whether an increase in the minimum wage can be said to alleviate poverty.

Three issues come in for detailed discussion in this section. The minimum wage is an effective tool of social policy if it increases the income of the poor rather than that of the more affluent, and if it costs less than other instruments. Therefore, we will first review the income distribution of those employees affected by the 2001 increase in the minimum wage.

The study was based on income data that originated from CSO surveys on the population and on data from self-assessments. This data source may include people who do not include their black labour income in their tax returns, stating only their officially received minimum wage. The identification of 'grey employees' is important for two reasons: on the one hand, statistics show them to be poorer than they actually are and thus we see the minimum wage more targeted than it actually is. On the other hand, the actual wage – and so their productivity – is higher than that of people 'really living on the minimum wage', so they are less exposed to the risk of becoming unemployed when the demand for labour drops as a result of a rise in the minimum wage. For this reason we are trying, with the aid of data on consumption, to identify people who are probably employed in the grey economy, and to establish the actual number of people genuinely living on the minimum wage.

Finally, using 2000 and 2001 household income data, we assess the changes in the income positions of minimum wage earners relative to their own earlier incomes and to those of other social groups, in order to see the real winners and losers from the rise in the minimum wage. The targeting of the increase and the changes in incomes were studied in the group of people actually living on the minimum wage, excluding individuals whose consumption data are indicative of incomes from grey employment.

The analysis was based on the merged data sets of 2001 and 2002 in the CSO Household Budget Survey (HBS). This survey is based on data supplied voluntarily, and since some people refused to participate in the survey and

---

with low schooling and those living in rural areas, as well as employees, are overrepresented among the supporters of the proposal' (Gábos, 2000).

[16] For example: 'At the same time the group of wealthy people is growing – though not very quickly – and as a result of a slight reduction in unemployment and an increase in the minimum wage the trend that has seen a growing number of poor people has come to a halt' Ferge (2003); 'in addition to the unemployed, poverty is greatest among people doing unskilled work, semi-skilled and agricultural manual work, and among the Roma population, most of whom belong to these groups anyway. The increase in the minimum wage in 2001 to HUF 40,000 was a step forward' Csáky (2001); 'An increase in the minimum wage, a wage rise for public servants, and redistribution based on social policy – despite all of these measures income inequalities grew in comparison to 2000' Németh (2004).

others did not report all their income sources, the sample contains fewer high income and more low income households than there actually are. Consequently, the average data on incomes and consumption are shown to be lower, and the income and consumption inequalities are shown to be much smaller than they actually are (CSO, 1997, pp. 23–24). Because the data sets were merged, about a third of the original sample is lost, but from the perspective of income distribution this did not cause any material distortion (*Figure 9*).

Who is affected by the increases in the minimum wage?

In our survey employees were considered to have been affected by the rise in the minimum wage if what they earned from their main employment was between HUF 45,000 and HUF 55,000 per month in the year 2000 sample. Accordingly, entrepreneurs were not included because their minimum wage is both cost and income at the same time, and so the impacts of the increase in the minimum wage are different. Individuals for whom there were substantial differences between their household incomes in 2000 and in 2001 that could not be explained by changes in their earnings and the composition of their households were also excluded from the sample used to assess income changes. Having eliminated any suspicious income changes, a total of 481 persons within the sample worked for the minimum wage in 2000. Projecting this onto the entire population, the increase in the minimum wage is thought to have affected some 340,000 employees.[17]

Table 6: Features of the 2000 data set and the merged data sets

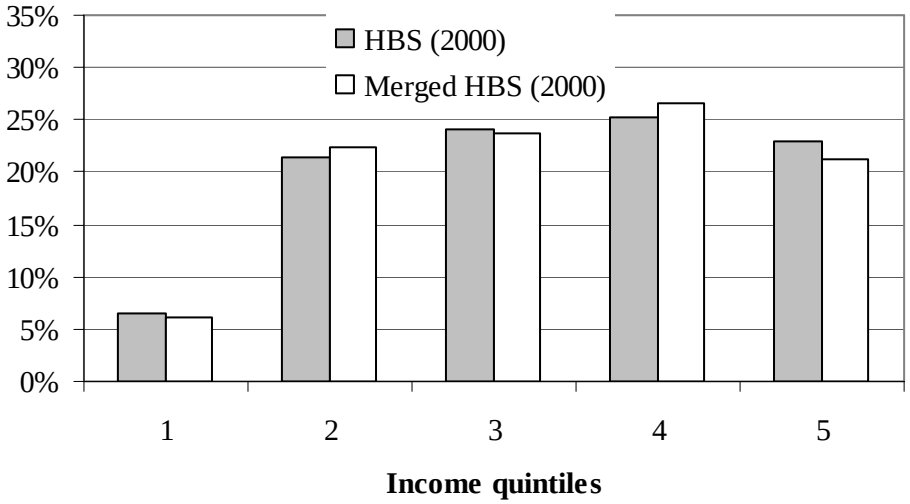
	Complete 2000 HBS	**Merged HBS (2000–01)**	
		2000	***2001***
Employees	8222	3805	3901
Minimum wage earners	1038	519*	524
'Genuine' minimum wage earners **	–	481	

Note: * Of whom 27 did not work in 2001 ** 'Suspicious' income changes eliminated. This requires data that are available only in the merged data set.
Source: CSO 2000 and 2001 Household Budget Survey (HBS).

Figure 9 shows that the overwhelming majority of those affected by the rise in the minimum wage are not positioned at the lower end of the income distribution scale. The majority of minimum wage earners live in households with relatively high per capita equivalent incomes.[18]

[17] A calculation using the original sample weighting factors of the HBS shows 372,000 people.
[18] The equivalent method of calculation of the per capita income takes account of the number of persons living in the household as well (a household of four does not spend four times as much as a household of one).

Figure 9: Relative income position of minimum wage earners according to per capita equivalent income of the household, 2000



Source: Authors' own calculations based on CSO's 2000 and 2001 HBS.

Having reviewed the main characteristics of those affected by the rise in the minimum wage, we conclude that minimum wage earners are typically not the primary earners – the breadwinners – in their families, and they do not typically fall within the poorest fifth of the population.

Table 7: Key features of people affected by the rise in the minimum wage in comparison to other employee groups (2000)

	Men	People with at least secondary education	Proportion of breadwinners	If not the breadwinner *		Number of persons living in household	Average age
				Wife	Child		
Unemployed	56.90%	22.30%	44.20%	47.70%	37.30%	3.6	36.8
Non-minimum wage earner	59.80%	52.40%	62.80%	68.50%	19.80%	3.3	41.6
Minimum wage earner	49.10%	37.40%	49.50%	63.40%	26.80%	3.3	39.1
High-income minimum wage earner	42.90%	48.10%	37.20%	58.60%	28.30%	3.1	39.7

Source: Authors' own calculations based on CSO's 2000 and 2001 HBS.
Note: * May be other relative or non-relative.

The majority (almost 63%) of minimum wage earners living in high-income households (top two-fifths) are not the breadwinners but spouses, partners or children. They typically have higher levels of education – most of them have completed secondary school – than the total group of people affected by the rise in the minimum wage, in which the highest percentage of individuals finished vocational school or apprenticeship school. Most of these people live in smaller households of 2–3 members.

These features support the argument that almost half of the individuals affected by the rise in the minimum wage live in higher-income households that are not targeted by social policy. The simple sample-average figures conceal the effects of composition, and therefore we also analysed the characteristics of minimum wage earners by logit regression. First we assessed the employment opportunities of minimum wage earners, along with the differences in these opportunities relative to those of other active people. In this case the variables of gender, age and level of education were applied to assess productivity, and the region variable was used to see the opportunities for employment near the place of residence. Compared to the total active population, most minimum-wage earners live outside the central Hungarian region and have at best completed primary education or have skilled worker qualifications; most of them are women (*Table 8*).

Table 8: Characteristics of minimum wage earners compared to the entire active population, 2000

	Average partial effect	p-value
South Great Plain	0.00042	0.97
South Transdanubia	–0.01744	0.18
North Great Plain	0.00735	0.57
Northern Hungary	–0.01406	0.26
Central Hungary	**–0.02730**	**0.01**
Western Hungary	0.00516	0.71
Skilled worker qualification	0.00137	0.88
Secondary education	**–0.01752**	**0.05**
Tertiary education	**–0.08168**	**0.00**
Men	**–0.04021**	**0.00**
Age	0.00130	0.50
Age^2	–0.00003	0.26
Number of elements in sample:	8534	
Pseudo-R^2:	0.0211	

Notes: 1. Basis of comparison: Central Transdanubia and primary education. 2. Variables significant at 5% are set in **bold**.

Secondly, we assessed whether support through the minimum wage might be justified on the basis of the role occupied in a household. In this test, the position in the family is approached through the breadwinner status[19] and the age variable, the number of persons being the number of those to be potentially supported. The issue was assessed separately by gender, assuming that the value of work carried out in the household may differ between men and women. The relationship between the role and the minimum wage earner status was also assessed in comparison to the active population and to the 15–59 age group.

We found that, compared to the active population (*Table 9*), breadwinner men are less likely to be affected by an increase in the minimum wage. The likelihood of belonging to this group, however, is not affected by the number of persons in the household, nor the age of the individual. In the case of women, none of the variables were found to be significant.

Table 9: Characteristics of minimum wage earners in comparison to the active population

	Men		**Women**	
	Average partial effect	p-value	Average partial effect	p-value
Number of individuals in household	–0.0017	0.63	–0.0016	0.755
Breadwinner	**–0.0448**	**0.01**	–0.0055	0.71
Age	0.0034	0.24	0.0045	0.16
Age^2	0.0000	0.17	0.0001	0.09
Number of elements in sample:	4547		3987	
Pseudo-R^2:	0.0057		0.0018	

Note: Variables significant at 5% are set in **bold**.

In the case of the (active and inactive) population aged 15–59 (*Table 10*) the more people living in the household, the smaller the probability of women belonging to the group affected by the increase in the minimum wage. This is probably explained by the fact that, in a household of several individuals, it is more useful for the woman to stay at home than to go out to work for the minimum wage. In the case of women, however, being or not being the breadwinner has no significant impact. The situation is just the opposite in the case of men: the

[19] The husband or the male partner is regarded in the HBS as the breadwinner in a single-family household. If one parent plus child(ren) make up a household, the parent is the breadwinner. In the case of multi-family households, selection is based on activity, gender and age – in that order – from among the breadwinners as defined in the case of a single-family household. The same order applies to households not forming a family (CSO, 1997, p. 64).

number of individuals in the household has no significant impact; but, at the same time, if the individual is the breadwinner, he is more likely to be affected by the rise in the minimum wage.

Table 10: Characteristics of minimum wage earners in comparison to the 15–59 age group

	Men		**Women**	
	Average partial effect	p-value	Average partial effect	p-value
Number of individuals in household	0.0012	0.635	**–0.0038**	**0.084**
Breadwinner	**0.0194**	**0.004**	0.0047	0.594
Number of elements in sample:	6326		7359	
Pseudo-R^2:	0.0024		0.0011	

Note: Variables significant at 10% are set in **bold**.

In summary, then: minimum wage earners have lower levels of education than other employees; women make up a larger proportion than men of minimum wage earners; and most of them live outside the region of Central Hungary, where the unemployment rate is lower. Most men on the minimum wage are not breadwinners, and most breadwinner women live in households made up of smaller numbers of people. In terms of their employment opportunities, minimum wage earners are in a less advantageous position than the average employee, but most of them are not breadwinners and live in households that include other wage earners as well.

Do minimum wage earners actually earn the minimum wage?

On the basis of anecdotal evidence, we assume that a certain proportion of minimum wage earners receive 'grey' income as well. In the CSO HBS data we tried to select minimum wage earners with additional grey income by comparing the income of the household to its expenditure and by reviewing the structure of expenditure.

People who, according to their household expenditure, belonged to an income group at least two quintiles higher than their income would suggest were regarded as making their living in the grey economy.

This was then refined by assessing the structure of expenditure. We assumed that the structure of the expenditure of minimum wage earners with additional grey income was similar to the structure of expenditure that corresponded to their actual income. When we investigate the main spending categories, in the top quintiles we find larger amounts and higher percentages of income being spent on transport and cultural/educational activities. Though

spending on eating out involves smaller amounts, it is also closely related to income. Accordingly, individuals who belonged to the bottom two quintiles by income, but whose spending on transport, education/culture and restaurants exceeded the average of the top three quintiles (both in absolute terms and as a percentage of income), were treated as recipients of grey income.

Based on the above considerations, a total of 1,057 persons – almost 4.5% of the total sample – were categorized as being involved in the grey economy. Some 5.2% of the economically active population qualify as earners of grey income, and such people make up 4% of the minimum wage earners (41 persons in the sample). Accordingly, it cannot be argued that the majority of minimum wage earners are registered as employed just to evade taxes: indeed *the majority* of people officially registered as minimum wage earners are actually paid that much.

This is also confirmed by the findings of a multivariate estimate (*Table 11*). Within the active population, most of those working in the grey economy live in Central Hungary or in South and North Transdanubia, and they have higher levels of education. However, we *cannot say* that being registered as a minimum wage earner would increase the likelihood of involvement in the grey economy.

Table 11: Likelihood of participation in the grey economy

Variables	Average partial effect	p-value
Men	–0.00357	0.19
South Great Plain	0.00093	0.88
South Transdanubia	**0.04055**	**0.00**
North Great Plain	–0.00005	0.99
Northern Hungary	0.00642	0.34
Central Hungary	**0.03206**	**0.00**
Western Hungary	**0.02039**	**0.01**
Apprenticeship school	**0.01203**	**0.01**
Secondary education	**0.01870**	**0.00**
Tertiary education	**0.03207**	**0.00**
Minimum wage earner	–0.00793	0.18
Entrepreneur	**0.07391**	**0.00**
Age	0.00005	0.86
Age ^{2}	**–0.00001**	**0.00**
Number of elements in sample:	24022	
Pseudo-R^2:	0.0485	

Note: Variables significant at 5% are set in **bold**.

Winners and losers

The winners and losers from the increase in the minimum wage were identified by grouping the individuals concerned according to the change in their relative standing and their income in terms of HUF: (1) people whose income position improved significantly; (2) people whose income position declined significantly; and (3) people whose income position did not vary significantly.[20] The main characteristics of categorization by the two aspects are presented in *Table 12*.

Table 12: Impact of the increase in the minimum wage on the income of the individuals concerned

	Based on change in HUF			**Based on relative income change**		
	Worse position	Unchanged position	Improved position	Worse position	Unchanged position	Improved position
Average annual nominal personal income change (HUF)	–191,543	85,891	274,193	–100,039	102,306	292,406
Average annual personal income change adjusted for inflation (HUF)	–174,447	78,225	249,720	–91,110	93,174	266,307
Number of persons	58	290	133	85	300	96

Source: Authors' own calculations based on CSO's 2000 and 2001 HBS.

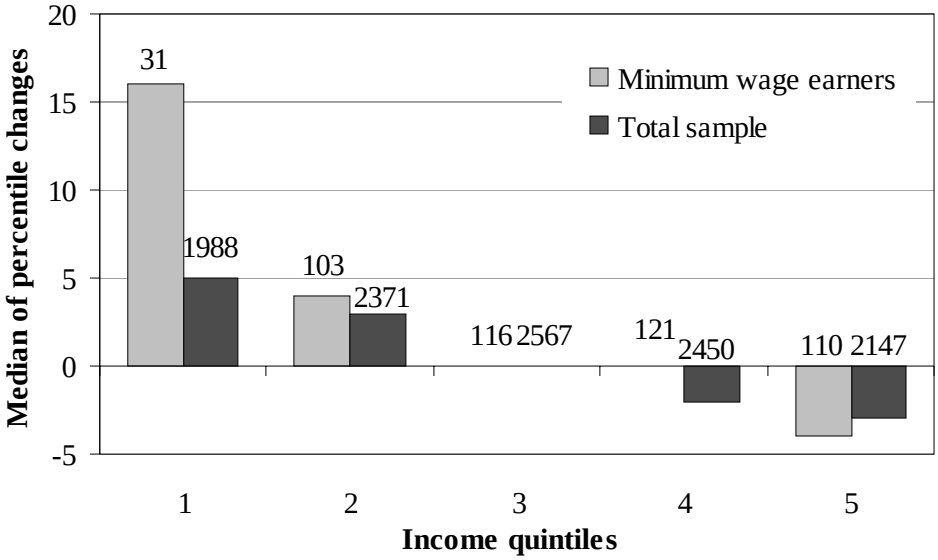
Both categorizations have their advantages and disadvantages. In the case of uncertain income data, the relative income change is more precise, for it only takes account of the positions of individuals relative to one another. However, in the case of this categorization – regardless of the change in income in HUF – the income position of those who belonged to the top quintile in 2000 *cannot improve* and the position of those in the bottom quintile in 2000 *cannot deteriorate*. This error is eliminated by grouping on the basis of income change in HUF. In this case, distortion is caused by incorrect income data.

Figure 10 shows that the changes in the relative income position of the individuals concerned are very significantly affected by their initial income. The

[20] The following approach was used in separating the groups. The position of people whose per capita (equivalent) household income dropped by at least 10%, or whose relative income position dropped by at least one quintile, were categorized as persons with significantly worse income positions. The position of people whose per capita household income increased by at least 30%, or who moved at least one quintile up, were categorized as persons with significantly improved income positions. Changes exceeding 12 percentiles were taken into account in moving people from quintile to quintile.

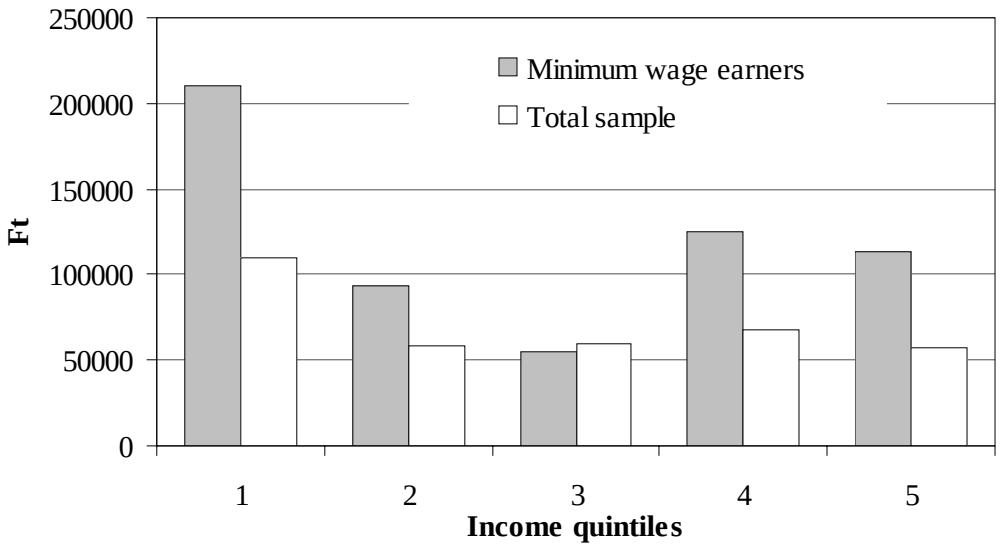
income position of minimum wage earners living in poor households (bottom income quintile) improved substantially, while that of more affluent individuals more often deteriorated. The income of poorer minimum wage earners increased at a higher rate than the income of non-minimum wage earning (or unemployed) poor people. An assessment of concrete personal income changes (*Figure 11*) shows that a relative improvement in the top quintile is observed in the form of higher-than-average income increases (HUF 210,000 per annum, rather than HUF 110,000).

Figure 10: Change in relative income position (based on household income)



Notes: 1. The figure shows the median of the differences between the percentiles of the individuals, calculated on the basis of the 2001 and the 2000 per capita household income. Accordingly, in the first quintile a 5 percentile change across the whole sample means that the relative income position of the average individual in the first quintile has improved by 5 percentiles. 2. The values above the columns show the number of individuals belonging to the given group (number of elements in sample, without weighting).
Source: Authors' own calculations based on CSO's 2000 and 2001 HBS.

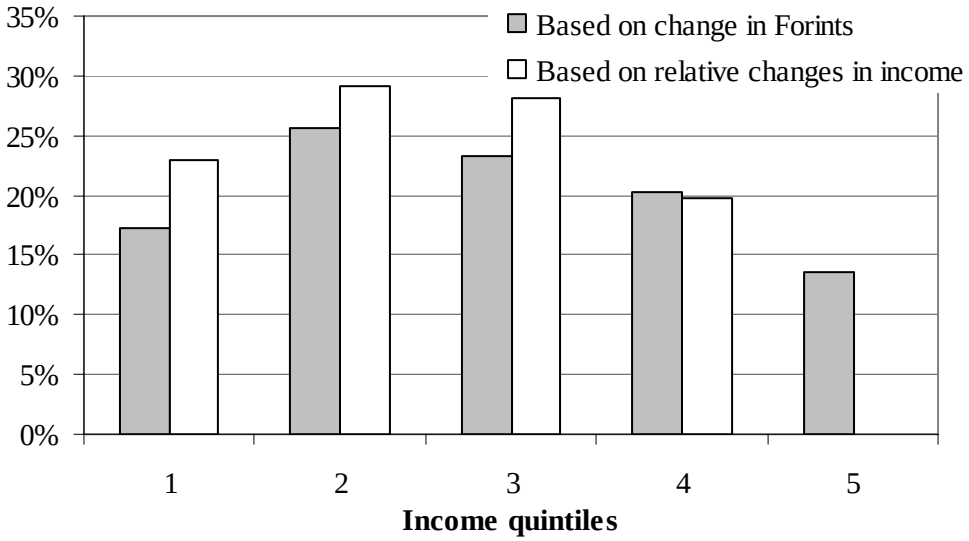
Figure 11: Average change in personal income by quintile (HUF)



Source: Authors' own calculations based on CSO's 2000 and 2001 HBS.

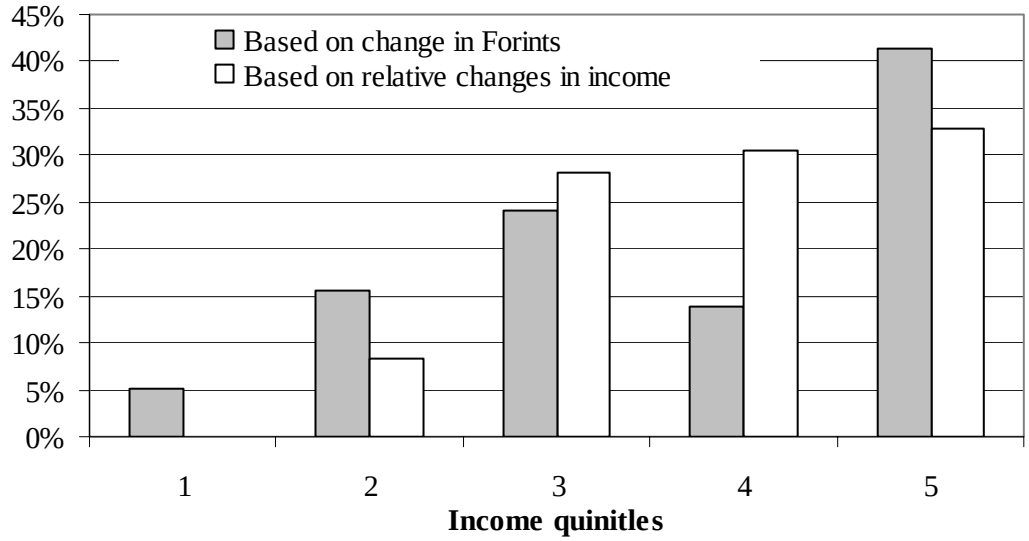
The income position of minimum wage earners living in poor households (bottom quintile) improved significantly, but this involves very few people: *Figure 10* shows that only 31 persons – or 6.4% of minimum wage earners – live in such households. As *Figure 12* shows, a large proportion of the winners (48% or 57%, depending on categorization) live in the top three quintiles.

Figure 12: Position of the winners from the increase in the minimum wage, based on the per capita equivalent income of the household (2000)



Source: Authors' own calculations based on CSO's 2000 and 2001 HBS.

Figure 13: Income position of losers from the rise in the minimum wage (2000)



Source: Authors' own calculations based on CSO's 2000 and 2001 HBS.

In 12% and 14% of all cases, the deterioration in the income position of the household (in terms of income change in HUF and in terms of relative income change, respectively) was caused by the fact that the minimum wage earning family member was made redundant between 2000 and 2001. In 2000 some 5.4% of minimum wage earners fell into this category. None of those who lost their jobs belonged to the bottom income quintile (*Table 13*), but this may be explained by the small number of elements in the sample. Most of them are men (16 out of 26), the majority of them with low levels of education. Their personal income dropped by an average of HUF 129,000 (the median drop was HUF 151,000) which is quite a considerable reduction in view of the income changes described above (*Figures 11 and 12*).

Table 13: Relative income position of people made redundant

Quintile	Number of elements in sample	Percentage of those made redundant	Number of those made redundant
1	31	0%	0
2	103	4.9%	5
3	116	8.6%	10
4	121	4.1%	5
5	110	5.5%	6
Total	481	5.4 %	26

Source: Authors' own calculations based on CSO's 2000 and 2001 HBS.

The following is a review of the extent to which the changes in the position of poorer families (bottom three quintiles[21]) depended on the characteristics of the minimum wage earner and of the household. The findings of regression analyses[22] show (*Table 14*) that a larger proportion of the people whose income position improved had tertiary or secondary education, and a smaller proportion of them lived in South Transdanubia and Northern Hungary, where unemployment rates are relatively high. A larger proportion of people whose income position deteriorated was made up of men, a smaller proportion of them having tertiary education.

Table 14: Factors determining changes in income position

Variables	**Based on change in HUF**			**Based on relative change in income**		
	Improved	Unchanged	Deteriorated	Improved	Unchanged	Deteriorated
Great Plain	–0.0591	0.1147	–0.0557	–0.0822	0.1272	–0.0450
South Transdanubia	**–0.2115**	0.2287	–0.0172	**–0.2520**	0.2624	–0.0105
Northern Hungary	–0.1248	0.0967	0.0281	**–0.1435**	0.1849	–0.0414
Central and Western Hungary	–0.0999	0.1007	–0.0008	–0.1001	0.0433	0.0568
Secondary education	0.0932	–0.0284	**–0.0648**	**0.1519**	–0.0585	**–0.0934**
Tertiary education	**0.2712**	–0.1620	**–0.1092**	**0.2664**	–0.2537	–0.0127
Men	–0.0139	–0.0019	0.0158	0.0214	–0.0876	**0.0662**
Age	–0.0051	0.0044	0.0021	–0.0155	0.0103	0.0105
Age^2	0.0001	–0.0002	0.0000	0.0002	–0.0002	–0.0002
Change in number of household members	**–0.2851**	0.4397	**0.0930**	**–0.2724**	**0.5317**	**0.1060**
Change in number of employees	**0.1048**	–0.2126	–0.0275	0.0593	–0.1756	–0.0097
Number of elements in sample:		250			250	
Pseudo-R^2:		0.0993			0.1174	

Notes: 1. Variables significant at 10% are set in **bold**. 2. The basis of comparison in the case of the regions was the South Transdanubia region, in the case of education it was the primary school and the apprenticeship school. 3. Average partial effect are presented in the table.

In summary, then: in addition to people living in poorer households (bottom income quintile) those who gained from the increase in the minimum wage included a lot of people in better income positions. Though the incomes of winners in better income positions grew at a smaller rate, these people definitely count as winners. By contrast, people in higher-income quintiles and those made redundant are losers. Winners tend to have higher levels of

[21] The bottom two quintiles contained few observations, and therefore minimum wage earners in the bottom three quintiles were studied.

[22] Due to the small number of people reporting deterioration or improvement in their income positions, the regression results are not precise.

schooling and the data do not confirm any significant improvement in the position of people living in less well developed regions, in the wake of the increase in the minimum wage.

6. Expected impacts of the 2006 increase in the minimum wage in Hungary

6.1. People to be affected by the increase in the minimum wage in 2006

On 28 June 2005 the government proposed introducing a HUF 63,000 general minimum wage, along with a HUF 70,000 minimum wage for people with secondary qualifications and HUF 77,000 for people with tertiary qualifications.

In the event, following agreement with the National Interest Reconciliation Council, the government issued a decree on 14 December 2005 to the effect that as from 1 January 2006, 1 January 2007 and 1 January 2008 the minimum wage would rise to HUF 62,500, HUF 65,500 and HUF 69,000, respectively. A differentiated minimum wage was introduced, but in the form of a guaranteed minimum wage for people working in jobs that require at least secondary qualifications. After a series of gradual increases, by 2008 this will equal 125% of the minimum wage, provided the individual has at least 2 years' work experience.

A forecast of the impact of the original proposal for a phased increase in the differentiated minimum wage (HUF 63,000 – HUF 70,000 – HUF 77,000) was produced by the Ministry of Labour and Employment Policy (MoLEP, 2005) on the basis of data from the wage tariff survey of May 2005, carried out by the Public Employment Service. The wage tariff survey covered organizations employing at least 5 people, and thus the forecast also applied only to such organizations.

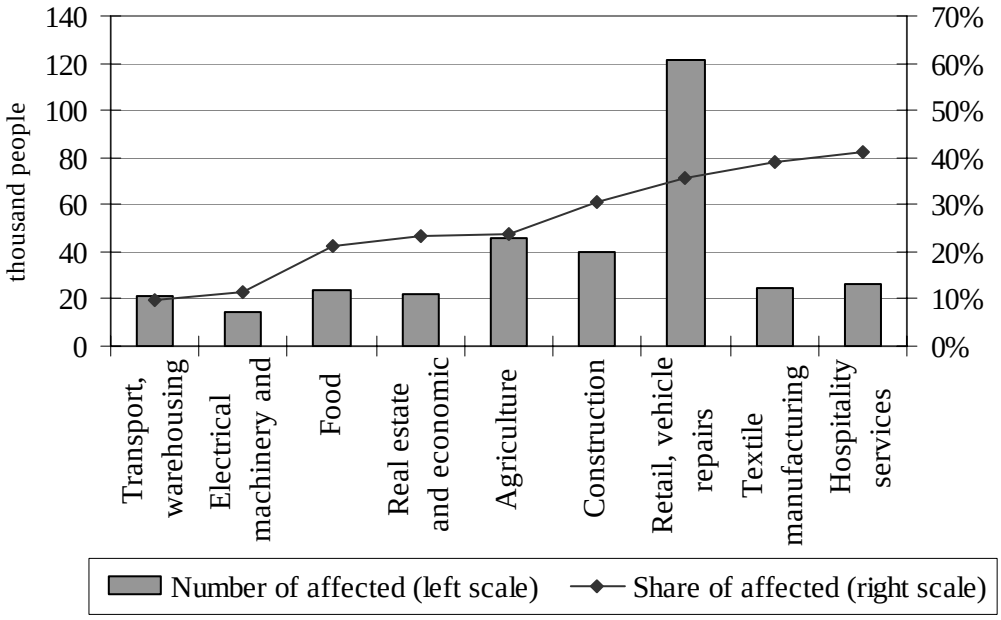
According to the MoLEP calculations, the impact of the increase in the minimum wage will be felt primarily by (mainly light industry and agricultural) enterprises that employ older or less well qualified persons in regions with higher rates of unemployment (South Great Plain and the North Great Plain), and by small businesses with 5–9 employees. The introduction of a minimum wage dependent on qualifications as well would affect some 31% of employees in businesses with more than 4 employees – or a total of 580,000 persons. A HUF 63,000 minimum wage that is not dependent on the level of qualifications would affect some 27% of the group, or some 510,000 people in the private sector.

This estimate, however, applied only to enterprises employing at least 5 people. According to the CSO's Labour Survey, though, some 300,000 people work for enterprises that employ fewer than 5 people, and there are some 500,000 people working as sole traders. The majority of these people work in agriculture or the service sector, and so the increase could affect 25–40% of this

group, too. Overall, then, up to 50% may be affected. Raising the minimum wage could, therefore, have an impact on some 700,000–900,000 people employed in the private sector.

In terms of headcount, the general rise in the minimum wage, plus the differentiated increase, will affect primarily the retail sector, vehicle repairs, economic services and construction (*Figure 15*). In retail alone, among enterprises that have more than 5 employees, the rise in the minimum wage will affect some 120,000 people. In terms of the proportions of employees, the hospitality and catering and the textile sectors will be most affected, with the statutory wage increase involving almost 50% of employees (*Figure 15*).

Figure 15: The number (in thousands of people) and proportion (%) affected by the HUF 63,000 minimum wage

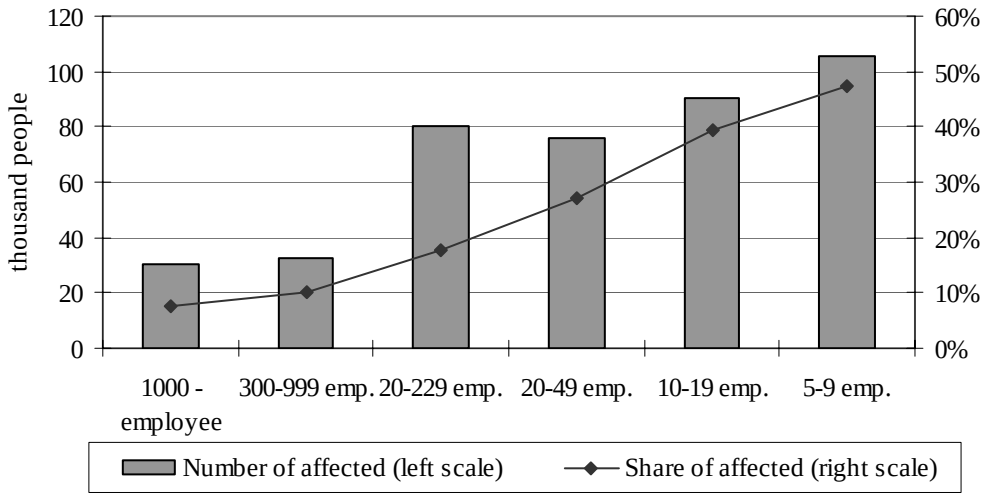


Source: Wage tariff 2005 May, MoLEP (2005).

According to the MoLEP forecast, the most substantial decline in employment is likely to take place in the light industry, while in agriculture and tourism we might see a significant increase in grey employment, rather than any particular loss of jobs. No negative change is expected in construction and retail, for wages are expected to increase in these sectors anyway. The wage-increasing effect of a higher minimum wage should not exceed 1% in most sectors (e.g. chemical industry, engineering, the energy sector, transport, finance), but in heavily affected sectors it could reach 3–7%.

In terms of company size, small enterprises will be most affected. In the case of entities that employ fewer than 50 people, some 25–45% of employees could be affected by the increase, with entities employing 5–9 people bearing the brunt of the change.

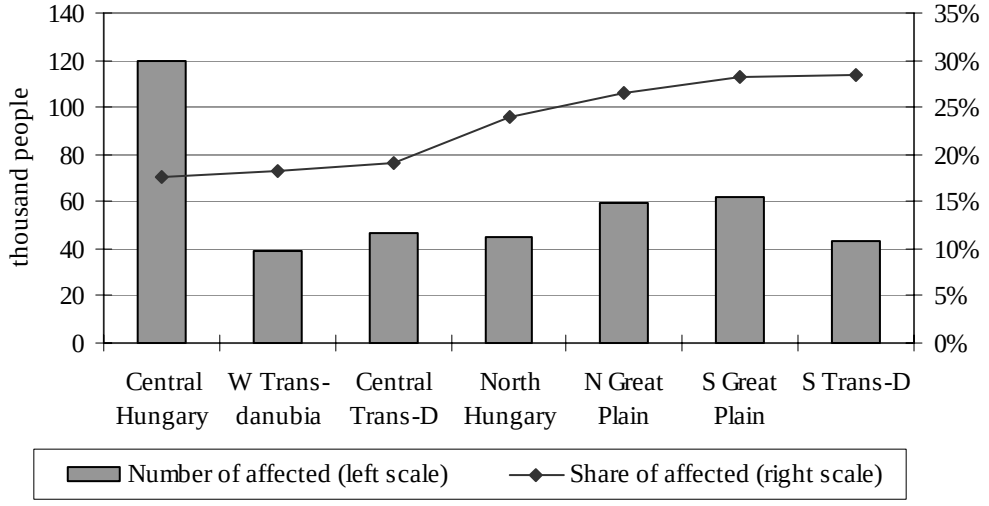
Figure 15: The number (in thousands of people) and proportion (%) affected by the HUF 63,000 minimum wage, by size of enterprise



Source: Wage tariff 2005 May, MoLEP (2005).

The South Great Plain and South Transdanubia are the regions most affected: almost 30% of the employees of businesses employing at least 5 people could be affected by the wage increase. Many people could be affected in Central Hungary as well.

Figure 17: The number (in thousands of people) and proportion (%) affected by the HUF 63,000 minimum wage in the various regions



Source: Wage tariff 2005 May, MoLEP (2005).

According to the MoLEP forecast, some 20,000 employees will be affected by the wage increase in the public sector. It should be noted that, as a consequence of the minimum wage previously introduced in the public sector

for people with tertiary education, the earnings of these people are already higher than HUF 70,000, and consequently only the general minimum wage and the minimum wage for those with secondary education would have any effect (MoLEP, 2005).

6.2. *Discussion of the expected impact of the 2006 increase and differentiation*

The wage increase starts from a higher base

Participants of the discussion at the Ministry of Finance agreed that the 2001 and 2002 rises in the minimum wage occurred in circumstances somewhat different from those in which the minimum wage will be increased in 2006. On the one hand, in 2000 the minimum wage was probably below the wage level prevailing in the market and was not really effective, whereas the 2006 increase – though smaller – will certainly be effective and may therefore have a more substantial impact (Gábor Kézdi). On the other hand, the economic prospects are more favourable this time round, with growing unemployment meaning that there is an ample reserve of labour and no strong pressure to increase prices (Gábor Kátay).

There was no consensus on the size of the increase: one group considered it to be substantial, given the current wage level and the idea for dealing with better-educated people (János Köllő, Gábor Kézdi); others argued that the increase was balanced somewhat by the reduced rate of health contributions and by the cut in social security contributions scheduled for 2007. In view of these reductions, employers may be more willing to accept a wage-cost increase in the short term (Gábor Kátay).

Opinions varied on the budgetary impact: Gábor Kézdi argued that the increase could affect a lot of people in the public sector as well, leading to increased expenditure; Balázs Romhányi, meanwhile, held that the increase introduced in 2001 for those people in the public sector with tertiary education had gone some considerable way down the road, and that the next increase would impose a smaller burden on the budget.

The impact of differentiation

There was agreement at the discussion that differentiation in the minimum wage by qualification was definitely harmful. Although some weighty economic arguments do support differentiation, these relate to some differentiation based on the productivity of employees, granting a concession to groups with lower productivity (young people, older employees, people living in regions short of capital). This aspect is hard to see in the government's proposal. Its approach will lead to tariff-based wage regulation and a rigid wage structure, which – especially in a low-inflation environment – will significantly impede the flexible adaptation of the labour market (János Köllő).

It is no coincidence that there is no previous example to go on of such a gross intervention in the way enterprises operate. That is why it is not possible to rely on other countries' experience in forecasting the impacts (Gábor Kézdi).

Differentiation by level of qualifications ignores the fact that, within various types of jobs, the level of schooling varies greatly in Hungary (e.g. 20% of janitors and 35–40% of commercial drivers have a Certificate of Secondary Education[23]) and there are people with higher qualifications working in virtually every job category. The wage advantage of skilled workers varies widely by occupation, and therefore the basis for differentiation is not quite clear: it is true, however, that it will definitely force employers to adapt, and this will inevitably result in losses (János Köllő).

The institutional framework and the goal of the minimum wage agreement

In addition to the impact of the specific increases in question, the discussion also touched on the whole idea of setting minimum wages, as well as on the appropriate criteria. László Halpern argued that the increased risk of unemployment and job losses that is consequent on an increase in the minimum wage is not taken into account by the trade unions: only the government can express this concern in the tripartite negotiations. That is why the government should not let the unions seize the initiative in the tripartite discussions.

János Köllő noted that the impact of the minimum wage should not be judged on the basis of change in the employment of the median voter (this is precisely what is meant by the aggregated employment level). Instead, it is the positions of unskilled (and older) employees that should be assessed: the employment of this group has declined dramatically over the past 15 years, and today it is extremely low by comparison with the EU average. People with low levels of qualifications are not typically employed in the service sector: they find employment in manufacturing jobs, on an assembly line or operating a machine – and it is there that the impact of the rise in the minimum wage is felt immediately.

According to Gábor Kézdi, the minimum wage is not the way to go about restoring respect for work. Although it may increase the willingness to work, in a labour market where employment is determined by demand, an increase in supply is of no help. This is one of the reasons why this is not an adequate tool for reducing poverty either. András Semjén also noted that using an increased minimum wage as a social policy tool is probably very expensive: a similar effect could be achieved by providing assistance or tax relief and would have far less harmful side-effects.

[23] Based on CSO's quarterly labour survey for the 2nd and the 4th quarter of 2004.

Appendix

Employment impacts of a rise in the minimum wage, based on Kertesi and Köllő (2004)

Table F.1: The results of the 3SLS estimate

	Coeff	St. error
Dependent: log change in real labor cost		
Log minimum wage gap × 1st region quartile	0.6554***	0.0537
Log minimum wage gap × 2nd region quartile	0.7071***	0.0674
Log minimum wage gap × 3rd region quartile	0.7629***	0.0678
Log minimum wage gap × 4th region quartile	0.7703***	0.1049
Profit 2000	0.0003**	0.0001
Constant	0.1247	
Chi-sq	305.861	0.0000
Dependent: log change of employment		
Log change of output	0.2522***	0.0242
Log change of labor cost	-0.4089***	0.1029
Fixed assets/worker 2000	0.0006*	0.0004
Industry dummies (10)	Yes	0.0794[4]
Region dummies (18)	Yes	0.3322[4]
Constant	0.1299	
χ^2	140.125	0.0000
Specification tests		
Exogeneity of labor cost (P>|t|)[1]	0.001	
Exogeneity of output (P>|t|)[1]	0.272	
Overidentification (P(χ^2))[2]	0.051	
Exclusion restrictions (P>F)[3]	0.002	

Durbin-Wu-Hausmann test. 2) Sargant test 3) Joint significance of the excluded exogenous variables. 4) F-test of joint significance. The cases are weighted with base-period employment.
Significant at the ***) 0.01 level **) 0.05 level *) 0.1 level

Source: Kertesi and Köllő (2004).

Budgetary effects of an increase in the minimum wage based on Halpern et al. *(2004)*

Table F.2: Change in PIT and contribution revenue subject to expansion of grey economy

Percentage of grey economy (minimum wage: HUF 28,083)	Percentage of grey economy (minimum wage: HUF 40,000)							
	22,5	25	27,5	30	32,5	35	37,5	40
22,5	0,0002	0,0017						
25		–0,0001	0,0014					
27,5			–0,0004	0,0013				
30				–0,0006	0,0010			
32,5					–0,0009	0,0008		
35						–0,0012	0,0005	
37,5							–0,0015	0,0003
40								–0,0018

Source: Presentation by László Halpern, based on Halpern *et al.* (2004). Increases in the minimum wage in Hungary 2001–06, workshop discussion. Ministry of Finance, 1 December 2005.

Table F.3: Change in general government deficit depending on minimum wage and proportion of grey economy (as a percentage of GDP)

Minimum wage (HUF)	Proportion of grey economy										
	0	10	20	30	40	50	60	70	80	90	100
	percentage										
28 083	3,26	3,08	2,95	2,87	2,84	2,87	2,96	3,13	3,39	3,79	4,37
35 000	3,10	3,03	2,97	2,94	2,92	2,93	2,97	3,05	3,16	3,33	3,57
40 000	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00
45 000	2,88	2,96	3,02	3,05	3,07	3,06	3,02	2,95	2,84	2,67	2,44
50 000	2,78	2,92	3,04	3,11	3,14	3,13	3,06	2,91	2,69	2,37	1,91

Source: *idem*.

References

Acemoglu, D. and Pischke, J. (1999): 'Minimum wages and on-the-job training', NBER Working Paper No. 7184.

Addison, J. T. and Blackburn, M. L. (1998): 'Minimum wages and poverty', Zentrum für Europäische Wirtschaftsforschung Discussion Paper No. 98-42.

Bazen, S. and Skourias, N. (1997): 'Is there a negative effect of minimum wages on youth employment in France?' *European Economic Review* 41, pp. 723–732.

Brown, C., Gilroy, C. and Kohen, A. (1982): 'The effect of the minimum wage on employment and unemployment', *Journal of Economic Literature* 20, pp. 487–528.

Card, D. and Krueger, A. (1994): 'Minimum wages and employment: a case study of the fast-food industry in New Jersey', *American Economic Review* 84, pp. 772–793.

Card, D. and Krueger, A. (1998): 'A reanalysis of the effect of the New Jersey minimum wage increase on the fast-food industry with *representative* payroll data', NBER Working Paper No. 6386.

Csáky, A. (2001): 'Legfontosabb társadalom- és gazdaságpolitikai feladataink' ['Our most important tasks in social and economic policy']. Speech by András Csáky MP (MDF) in a parliamentary debate on 11 May 2001.

CSO (1997): 'A Háztartási Költségvetési Felvétel módszertana' ['Methodology of the Household Budget Survey'], Statisztikai Módszertani Füzetek 37. Budapest: Central Statistical Office.

Dolado, J., Kramarz, F., Machin, S., Manning, A., Margolis, D. and Teulings, C. (1996): 'The economic impact of minimum wages in Europe', *Economic Policy* 23, pp. 317–372.

Eurostat (2005): 'European minimum wage survey', *European Industrial Relations Review*, August 2005.

Ferge, Zs. (2003): 'Introduction', in Bass, László, Ferge, Zsuzsa and Márton, Izabella, *Gyorsjelentés a szegényedésről* [*Flash Report on Poverty*]. Budapest: Szociális Szakmai Szövetség.

Gábos, A. (2000): 'Elemzések a gazdasági és társadalompolitikai döntések előkészítéséhez 13' ['Analyses for the support of economic and social policy decisions No. 13']. Budapest: TÁRKI.

Halpern, L., Koren, M., Kőrösi, G. and Vincze, J. (2004): 'A minimálbér költségvetési hatásai' [Budgetary effects of the rise in the minimum wage'], *Közgazdasági Szemle*, Series 51, April 2004, pp. 325–345.

Katz, L. and Krueger, A. B. (1992): 'The effect of the minimum wage on the fast-food industry', *Industrial and Labor Relations Review* 46, pp. 6–21.

Kertesi, G. and Köllő, J. (2002): 'Labour demand with heterogeneous labour inputs after the transition in Hungary, 1992–1999 – and the potential consequences of the increase of minimum wage in 2001 and 2002'. MTA-KTK Budapesti Munkagazdaságtani Füzetek 2002/5.

Kertesi, G. and Köllő, J. (2003): 'Ágazati bérkülönbségek Magyarországon, I. rész, Az ágazati járadékképződés alternatív modelljei' ['Sectoral wage differences in Hungary, part I: Alternative models of sectoral rents'), *Közgazdasági Szemle*, Series 50, November 2003, pp. 923–938.

Kertesi, G. and Köllő, J. (2004): 'A 2001.évi minimálbér-emelés foglalkoztatási következményei' ['Employment effects of the 2001 rise in the minimum wage'], *Közgazdasági Szemle*, Series 51, April 2004, pp. 293–324.

Kertesi, G. and Köllő, J. (2005): 'Minimálbér-emelések', in *A magyar foglalkoztatáspolitika átfogó értékelése az Európai Foglalkoztatási Stratégia kontextusában, az elmúlt öt év tapasztalatai alapján* ['Minimum wage rises', in *Comprehensive Assessment of the Hungarian Employment Policy Based on the Past Five Years' Experience, in the Context of the European Employment Strategy*). Budapest: Ministry of Employment and Labour, mimeo.

Kézdi, G., Horváth, H. and Hudomiet, P. (2004): 'Munkaerő-piaci folyamatok, 2000–2003' ['Labour market trends 2000–2003'], in Kolosi T., Tóth I. Gy. and Vukovich Gy., *Társadalmi Riport, 2004.* Budapest: TÁRKI.

Köllő, J. (2001): 'Hozzászólás az elmaradt minimálbérvitához' ['Remarks on the lagging minimum wage debate'], *Közgazdasági Szemle*, Series 48, No. 12, pp. 1064–1080.

Machin, S. and Manning, A. (1997): 'Minimum wages and economic outcomes in Europe', *European Economic Review* 41, pp. 733–742.

Maloney, W. F. and Mendez, J. N. (2003): 'Measuring the impact of minimum wages: evidence from Latin America', NBER Working Paper No. 9800.

Manning, A. (2003): *Monopsony in Motion*. Princeton and Oxford: Princeton University Press.

Manning, A. and Dickens, R. (2002): *The Impact of the National Minimum Wage on the Wage Distribution, Poverty and the Gender Pay Gap*. Report to the UK Low Pay Commission.

Michl, T. R. (1999): 'Can rescheduling explain the New Jersey minimum wage studies?' Levy Economics Institute Working Paper No. 271.

Ministry of Employment and Labour (MoLEP)(2005): 'A minimálbér 2006. évi emelésével kapcsolatos háttéranyagok' ['Background material for the 2006 rise in the minimum wage'], 22 July 2005.

Németh, Sz. (ed.) (2004): 'Kevesebb nyertes mint vesztes' ['Fewer winners than losers'], *Magyar Hírlap*, 3 April 2004.

Neumark, D. (1999): 'The employment effects of recent minimum wage increases: evidence from a pre-specified research design', NBER Working Paper No. 7171.

Neumark, D. and Nizalova, O. (2004): 'Minimum wage effects in the longer run', NBER Working Paper No. 10656.

Neumark, D., Schweitzer, M. and Wascher, W. (2000): 'The effects of minimum wages throughout the wage distribution', NBER Working Paper No. 7519.

Neumark, D. and Wascher, W. (1994), 'Employment effects of minimum and subminimum wages', reply to Card, Katz and Krueger, *Industrial and Labor Relations Review* 47, pp. 497–512.

Neumark, D. and Wascher, W. (1995): 'The effect of New Jersey's minimum wage increase on fast-food employment: A re-evaluation using payroll records', NBER Working Paper No. 5224.

Neumark, D. and Wascher, W. (1997): 'Do minimum wages fight poverty?' NBER Working Paper No. 6127.

Neumark, D. and Wascher, W. (2000): 'Using the EITC to help poor families: new evidence and a comparison with the minimum wage', NBER Working Paper No. 7599

OECD (1997): 'Labour market policies: new challenges – policies for low-paid workers and unskilled job seekers', OECD paper prepared for meeting of the Employment, Labour and Social Affairs Committee at ministerial level, 14–15 October 1997, OECD/GD(97).

OECD (1998): 'Making the most of the minimum: statutory minimum wages, employment and poverty', Chapter 2 in *Employment Outlook 1998*.

Palócz, É. and Tóth I. J. (2003): *A 2002. évi bérnövekedés okai. Elemzés a statisztikai adatok és egy vállalati felmérés tükrében* [*Causes of the 2002 Wage Rise. Analysis Based on Statistical Data and a Corporate Survey*]. Budapest: MKIK Gazdaság- és Vállalkozáselemzési Intézet.

Pereira, S. C. (1999): 'The impact of minimum wages on youth employment in Portugal'. University College London, Economics Department.

Popper, L. (2002): 'A 2001–2002. évi minimálbér-emelés hatása a hazai kereseti arányokra' ['Effect of the 2001–2002 minimum wage rise on domestic wage rates']. *Munkaügyi Szemle* 46(6 and 7–8), pp. 10–14 and 13–17.

Rama, M. (2000): 'The consequences of doubling the minimum wage: the case of Indonesia', *Industrial and Labor Relations Review* 54, pp. 864–881.

Regnard, P. (ed.) (2005): 'Minimum wages 2005: major differences between EU member states', *Statistics in Focus*. Eurostat.

Saget, C. (2001): 'Is the minimum wage an effective tool to promote decent work and reduce poverty?' ILO Employment Paper 2001/13.

Simon, K. I. (2003): 'Do minimum wages affect non-wage job attributes? Evidence on fringe benefits and working conditions', NBER Working Paper No. 9688.

Table of contents

Available Working Papers in the series

1. László Kállay, Eszter Kissné-Kovács, Kálmán Kőhegyi: Market environment, regulation and support for small enterprises. August 2003.
2. Tamás Fleischer: Infrastructure networks and competitiveness. August 2003.
3. Magdolna Sass: Competitiveness and economic policies related to foreign direct investment. September 2003.
4. Ágota Scharle: Competitiveness and the labour market. October 2003.
5. György Pataki, Györgyi Bela, Norbert Kohlheb: Competitiveness and environment protection. December 2003.
6. Balázs Borsi: Technological modernisation, innovation and research and development as factors of competitiveness in the economy of Hungary. February 2004.
7. Orsolya Lelkes: Social cohesion in Hungary: Theoretical foundations and facts. March 2004.
8. John Hills: Privatisation and public welfare: Principles and economic analysis. May 2004. (Available only in Hungarian)
9. Dóra Benedek, Orsolya Lelkes, Ágota Scharle and Miklós Szabó: The structure of general government expenditure and revenues in Hungary, 1991-2002. August 2004.
10. Dóra Benedek and Orsolya Lelkes: Assessment of income distribution in Hungary using a microsimulation model. January 2005.
11. Mária Lesi and Gabriella Pál: Theoretical foundations and EU regulation of carbon-dioxide emission trading. March 2005.
12. Mária Lesi and Gabriella Pál: The expected impact of the introduction of the carbon-dioxide trading on the domestic power market. April 2005.
13. Zsombor Cseres-Gergely: Inactive middle-aged people and households: incentives and constraints. June 2005.
14. Róbert Iván Gál, Árpád Törzsök, Márton Medgyesi and Tamás Révész: Generational accounts in Hungary, 1992-2001. July 2005.
15. Anna Vidor: The effect of saving incentives: empirical evidence from Hungary, October 2005.